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The Leading Magazine of Air Progress and Aeromodeling
July, 1951

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THE READERS WRITE:

All Communications to the Air Trails editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

Wee Bee Smaller than Stits Jr.? . . . Reading the article "Aerial Half-Pint" in a recent issue, I started thinking that your readers should judge for themselves as to which is the smallest airplane in the world—the Stits Jr. so labeled in that article, or the Wee Bee. Circle the smallest figure in each column below, then add up the number of circles for each airplane. You be the judge.

	Stits Jr.	Wee Bee
Wt. empty (lbs.)	396	215
Prop diam. (in.)	60	48
Cruis. speed (mph)	150	70
Land. speed (mph)	60	48
Ground run (ft.)	500	550
Landing run (ft.)	800	300
Fuel capacity (gal.)	4.5	2
Powerplant (hp)	85	28
Ht. above ground (ft.)	4.3	4
Wingspan (ft.)	8.7	18
Wing chord (in.)	49	30
Fuselage lgth. (ft.)	11.3	14
Wing loading (lbs./sq. ft.)	15.7	9

The Wee Bee (Nov. 1950 Air Trails) employs all the modern design characteristics of current aeronautical skill. The ship is of all-metal construction and has a tricycle spring steel landing gear with nose wheel steering. With exception of the powerplant, the Wee Bee airframe is fully capable of being certified under Civil Air Regulations Part 03 Normal Category.

The airplane flies hands-off very nicely and stability tests to date indicate that it is comparable to other light aircraft. Any pilot large or small can fly the ship. Five pilots have flown the Wee Bee, one weighing 130 lbs. and one weighing 200 lbs. (including parachute). Also, the experience of our pilots has varied from 6,000 hours to 50 hours of flying time. Like the Stits Jr. the ship is limited in altitude by its fuel supply; nevertheless, we have demonstrated flight at 2,000 ft.

William F. Chana, Ken S. Coward Associates
San Diego, Calif.

• Bill Chana, who flies the Wee Bee and together with Karl Montijo and Ken S. Coward forms the Ken S. Coward Associates, the designers and builders of this tiny plane, has a point here. The argument has been kicked around for a couple of years. From the standpoint of actual "size," Ray Stits claims his baby is the smaller, and he is correct; compare the span, length and wing area of the two planes. But so is Bill Chana correct according to his criteria. . . . So please, won't somebody build a man-carrying airplane that is smallest as to size, weight, power and performance, to end all possible contention?

This PBY Did 180 mph . . . It was with interest that I read the letter by R. L. Carlisle about the speed of the PBYs. I am prompted to write because, although the speeds he quoted are not incorrect, he has attempted to compare indicated airspeed in knots with true airspeed in miles per hour.

In the case of the PBY, apart from corrections for height and temperature, there is a position error correction of approximately plus 9 knots which must be taken into account when computing true airspeed.

During the 1939-45 war I flew as a PBY captain with units of the RAF, RCAF and South African Air Force. As an example of the difference between indicated and true airspeed, and also of the cruising speed obtainable with a PBY, on one occasion between Madagascar and Durban, South Africa, the PBY-5B was indicating 100 knots at 10,000 ft. with an outside temperature of plus 17 degrees C. and cruising settings of 29½" Hg. manifold pressure and 2,000 rpm.

When corrected for height, temperature and position error, the 100 knots indicated becomes 130 knots or 150 mph true airspeed. The above performance, incidentally, was at a weight of approximately 33,000 lbs., with four 250-lb. depth charges carried externally.

The fastest I can recall flying a PBY was one day over the Straits of Juan de Fuca, happily engaged in chasing a USN PBY in order to get a closer look. This was in a Boeing Aircraft of Canada-built PBY-5AMC (amphibian version). The weight at the time was about 28,000 lbs. with no external armament being carried, and using climbing revs and boost of 2300 rpm and 37" Hg. The aircraft, much to my surprise, indicated 136 knots, and this in level flight off a climb. The T.S.S., after allowing for altitude of 4,000 ft., temperature of plus 15 degrees and position error, works out at 156 knots, or 180 mph.

Of course, loaded to the 36,300 lbs. at which convoy escorts or anti-submarine patrols were usually started (262 Squadron), in maximum lean mixture the BPY-5B rarely exceeded an indicated speed of 85 knots; and at low altitudes (1,000-1,500 ft.) and higher air temperatures generally experienced, around plus 25 degrees C., the true airspeed is about 112 mph.

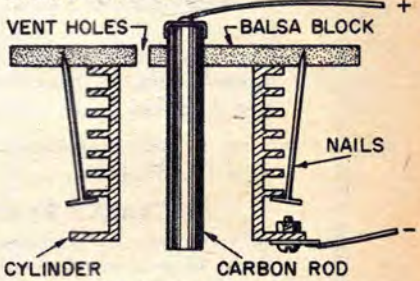
At this point it is usual to state that one has read your fine magazine for so many years. I am no exception, having started with Bill Barnes, about 1934. Bill Barnes has gone but I expect to be with you for many years to come.

W. R. Wickson, Vancouver, B. C., Can.

You Can Chrome-Plate Cylinders Too! . . . Modelers who have succeeded in plating pistons according to the directions given in my article in the February issue of Air Trails may have notions that the ring motor could be speeded up if the inside walls of the cylinders could be chrome-plated. And they can be. Bill Wellborn, president of the *Topeka Aerobats*, and some of his college mates have developed a simple rigging that works like a charm.

Start with a round block of balsa, about 3" in diameter and about ½" thick. Tear up a standard flashlight cell and recover the carbon rod. Drill a hole in the center of the block so the carbon will be a snug fit. Bore two or three 3/16" holes near the carbon in the block for the gas to escape. Solder a lead wire on the brass cap on the carbon rod. Bolt a lead wire on the cylinder and center the cylinder over the carbon rod, using nails pushed into the balsa block to hold the cylinder in place. Motors with cylinder and case integral can be handled too.

The cylinder must be cleaned carefully as described in the article referred to. *Be sure the carbon electrode is positive and the cylinder negative.* With a warm, not too hot bath, the full battery current can probably be used and the rheostat dispensed with. Three to five minutes should be sufficient for the plate, as the idea is not to build up wear, but to put on a thin plate to lessen friction on the rings.



CROSS SECTION RIG FOR PLATING CYLINDER

Details of the plating process, the composition of the electrolite and the "do-how" were all given in "You Can Chrome-Plate Pistons" in the Feb. 1951 AT.

C. O. Wright, Topeka, Kans.

Salute from Ground Observer Corps . . . Your article on Air Mobilization . . . is appreciated by those in the Air Force who are engaged in furthering the Ground Observer Corps expansion.

The part that the model airplane builders can contribute to meeting the problem of aircraft recognition cannot be over-emphasized. The youth of America can contribute materially to the education of their elders who will be actively engaged in the Ground Observer Corps program. Their efforts in not only producing scale models for recognition programs, but in interesting their parents and others through their own efforts is an added stimulus to the program.

Col. John F. Fletcher, USAF,
Director Civil Air Defense

(*Continued on page 9*)

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Sky Box Stunt 42" B-C-D	3.95
Sophomore 9 26" A	2.48
Sophomore 19 32" A	2.98
Sophomore 29 39" B	3.98
Speedster 12" AA	2.50
Speedwagon 20 18" A	3.95
Speedwagon 30 15" B	4.95
Speedwagon 50 15" C-D	5.95
Sportwing 36" A-B-C	5.95
Squaw 36" A-B-C	5.75
Stinson Sta. Wagon 45" B-C-D	5.50
Stinson . . . . 22" AA	1.98
Streamliner 25" B-C-D	4.00
Stunt Runt 16" AA	1.00
Stuntmaster 40" B-C	5.95
Stuntwagon 30 44" B-C	6.95
Stuntwagon 58" D	7.95
Super Cinch 36" B-C	2.95
Super Clown 38" B-C	2.95
Super Duper Zilch 52" C-D	5.95
Super Sky Box Stunt 47" C-D	4.50
Super Squirt 21" (Jet)	5.95
Super Stunt Runt 30" A	1.98
Sweet Chariot 18" AA-A	2.50
T-28 N.A. Trainer 50" B-C	5.95
Taylorcraft 35" A.B.C.	2.95
Thunderbolt 40" C-D	4.95
Trail Blazer 24" B-C-D	2.98
Trixter Babe 20" AA	1.25
Trixter Invert Jr. 40" A-B	4.95
Trixter Prof. Trainer 32" A-B	4.50
Trixter Profile 32" A-B	2.50
Trixter Profile 36" B-C	3.50
Trixter Twin Profile 47" B-C	5.00
Tuffy 24" AA-A	1.98
Vampire 40" B-C	4.50
Viking 51" C-D	5.75
Waco 33" B-C	5.95
Warrior 36" A-B-C	4.95
Wee Duper Zilch 24" AA	2.98
Wee Willie 18" AA-A	1.95
Whirlaway 11" AB	3.95
Wildfire 22" B-C-D	1.98
Wing Ding 15" AA-A-B	2.25
Wing Dingus 16" AA	2.25
Yank 23" AA	1.50
Zing 24" C-D	4.95

BURIED IN THIS AD

are most of the new items. Sometimes there isn't time or space to include them. But, if available, we have it.

ACCESSORIES

FUELS (Continental U.S.A. Only)

For Ignition	Pts	Qts
Ohlsson #1, #3	.85	1.60
Power Mist #6	.65	—
For Glo		
Ohlsson #2, #4	.85	1.60
Ohlsson AA	.85	—
Powermist Glo	.95	—
Powermist Spitfire	.95	1.60
Ranger Glo	.50	—
Testors 29	.75	—
Dynaglo	.85	—
Ranger AA	.50	—
Blue Blazer #1	.70	—
Blue Blazer #2	.80	—
Ranger & Infant	.90	—
OK Cub	.85	—
Spitzy	.85	—
Supersonic 100	.80	—
Supersonic 1000	1.00	—
Supersonic Ultra Glo	.90	—
Pouring Spout For pint cans	.10	
Hot Fuel Proofer	.25, .35 & .45	

PROPELLERS

Rite Pitch Stunt 8, 9, 10, 11, 12, 13, 14 in., 6 and 8 pitch 25
Rite Pitch 8, 9, 10, 11, 12, 13, 14 in., 6 & 8, pitch 25

Scamper Plastic 5½" 3p., 6" 4p. .25; 9" 6p., 45 10" 10p., 11" 8 p., .65
Super Spl. 8", 9", 10" 11" in 6 & 8 p. .15
Veco 6" 3p, 4p, 7" 4p, 5p, 8" 5p, 6p, 9" 6p, 7p. (8"—25¢; 7" & 8"—30¢ 9"—35¢)
Also Ohlsson, Flo-Torque, Power, etc.

RUNNING & TEST BLOCKS

E-Z Running Stand 1.50
Universal Running Blocks 1.50

METAL GAS TANKS

Dale Stunt Tanks—All Sizes 85
#1—1½x1¼x3½ #4—1½x1¼x5½
#2—2¼x1½x3½ #6—1½x1¼x11
#3—2¼x1½x5 #12—3½x1¾x5
#15—2¼x1¼x3½
Froom: 1¼x1½ or 2 hor. or ver. .50
1¼x1¼x3½ Sq. 50
1½x 1¼x2½ Wedge 80
1½x1x2½ ½-Rnd Stunt .80
Also Masco, Berkeley, Acme

IGNITION COILS

O.K. . . . . 1.50 Rogers 2.00
O.K. Twin . . 4.00 Wilco 1.95

SPARK & GLO PLUGS

Arden Glo (V2 or V3) 85
Champion Glo V, V2, V3 75
Champion V, V2, V3, VR1, VR2 .60
McCoy Hot Point 65
Ohlsson Glo (V, V2 or AA) 65
O.K. Glo-plug (V2 or V3) 59
Plug washers 05

IGNITION ACCESSORIES

6 ft. Hook-up wire 25
Arden Booster Jack 1.25
Arden Booster Plug-in 50
Midget Switch; slide—.25 Turn .50
Ohlsson Snap-Pack 35

PROP SPINNERS

1¼"-.85; 1¾"-.90; 2"-.95; 2½"-1.10
3" Needle Nose 1½" dia. 1.15
" " 2" 1.20
Plastic 1½" 50
Scamper Plastic 1½", 1¾", 2", 2¼" 45

WHEELS

Semi Pneumatic (pr) 2" 1.10
2¼" — 1.25 3" 1.75
Sponge Rubber, Dural hub (pr) 1¼"-1" 30¢ 1¼"; 1½" 35¢ 1¾" .45
1¾"—60¢, 2¼" 75
Tail Wheels ½": 1 15
Treaded Foam (pr) 1½" or 1½" 1¼", 2"—50¢; 2½", 2½"—60¢ 2¾" 1.00
3" 1.25
3½" 1.50

AA ACCESSORIES

Shut-off Valve (state engine) . . .65
E-Z Mixtmaster 1.00
.004 or .006 x 2—35" 35
.006 x 3—52" 50
Flex Needle Valve (infant, spitfire torp Jr. & .049) 50
Flex Needle Valve (Cubs) 1.00
Spinners (state engine) 60
Presto Starter (state engine) 25
Props (state engine) . . . .15 .25
Tanks (state engine) . .50, .60, .75
Neoprene (ft) 15
Fuel Meter 50

MISCELLANEOUS

Batt. Box Pen. and Medium 40
reg. .50
Brass Tubing 1/16", 5-32", 1/8" .20
Copper Tubing ¼" OD, per ft. . . .20
Finger Guard 40
Fuel Pump ½ pt., pt. . . . .69 qt. .79
Presto Dise Starter 25
Metal Motor Mounts, 3in—30¢; Lg. 50
Metal Pump Can 1.75
Needle Valve Exten. flexible 25
Neoprene Tubing, per foot 20
Spitfire Timer Valve 2.95
Transparent (veg. or AA) ft. . . . 1.00
No. 70 oil, 3 oz.—.25¢; pint 60
Plastic Fuselage 19" set of 2 50
Plug Wrench, 3-way—15¢; 4-way .25
Plywood (6"x12") 1/32" 20
1/16"—25¢; 1/8"—30¢; 1/4" 35
Silk per yard 1.50
Socket Plug Wrench, 4-way 60
Spinner Starter 5.00
Universal Needle Valve 50
Flexible 75
Vibratac 2.00

DOPES (Cont'l U.S.A. Only)

Aeroglass (20z and 60z sizes) Fliercoat, Cement, Plastic Balsa, Cessna Green, Cessna Gray, Orange, Yellow, Corsair Blue, Curtiss Blue, Fisher Red, Black, Lambert Gray, Aluminum, Stearman Red, Stinson Green, White, Cream, Maroon.

COMET (10z and 25z sizes) Cream, Green, Gray, Red, Gloss Top Coat, Horizon Blue, Black, Midnight Blue, Orange, Maroon, Gold, Sanding Sealer, Silver, White, Yellow.

Speed-o-lag (10z and 35z sizes) Aeronca Orange, Army Yellow, Aeronca Yellow, Banana Liquid, Black, Gray, Chocolate Brown, Cub Blue, Cub Cream, Cub Green, Cub Yellow, Gloss Top Coat, Insignia Blue, Insignia Red, International Orange, Metallic Blue, Olive Drab, Sanding Sealer, Silver, Stinson Green, Taylorcraft Cream, Taylorcraft Yellow, Tennessee Red, Maroon, Waco Blue, White.

CLEAR DOPE Aeroglass 20z and 80z; Comet 10z and 25z; Speed-o-lag 10z and 35z.

THINNER Aeroglass 20z and 45z; Comet 10z and 25z; Speed-o-lag 10z and 35z.

U-CONTROL ACCESSORIES

Adjustable Push Rod set 25
Bellcrank 2" or 3"—10¢, 4" 15
BERKELEY control lines
.008, .010, .012: 2-50' 50
.008, .010, .012, .014 2-70 65
.008, .012, .016: 2-150' 1.00
Stranded .015, .021 55' 1.00; 70' 1.25; 200' 3.50
Berkeley Metal Flight Reel 1.25
Berkeley Metal Handle 1.00
Elevator control horn; Veco 30
Elevator hinge 4 for 10
E-Z Plastic Control Handle 85
Flex Lead-in wire AA or A-B 3 ft. 15
Instant-Use Handle, 5 or 6" 50
Luxon Clips A, B, C or D Pr 10
PYLON control lines
.008, .010, .012, .014, .016 dia. 2-52' lines 60
.008, .010, .012, .014, .016, dia. 2-70' lines 75
Flexible 2-52' 1.50; 2-70' 1.95
Pylon Control line Reel 1.25
Pylon Plastic Handle 5" or 6" 85
Reel Pal Reel 1.00
Simplex Handle & Reel 1.50
Stunt Bellcrank & Elev. Horn 25
Swivel, small 15¢ pr.; large 20
Tommy Handreel 1.75
U-Reely Contr.—7.50; cable . . . 8.50
U-Reely Remote 12.50
Veco Bellcrank . . . . . .30 & .25
Wood Control handle 25

MODEL BOATS

Chris-Craft 26" C-D 6.75
Chris-Craft Express 22" BCD . . . 5.75
Chris-Craft Runabout 25" BCD . . . 6.25
Harco 23" B-C-D 6.25
Owens Yacht 26" B-C-D 6.25
Vineyard 25" BCD 6.25
Dumas Electric Drive Unit for 6 above ships 4.00
Buckeye prefab. 17" A-B-C 4.95
" Cabin Cruiser 17" ABC . . . 5.95
C.C. Riviera . . 12" AA 2.95
Plus Many Others

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Cox .15 or .099 Engine only . . . 8.95
Cox .19S Engine only 8.95
Cox car ready to run with engine 13.95
Cox Dirt Trade 2.49
Champion car ready to run with Cox Engine 19.95
Thimbledrome Race Car 4.95

RACE CARS

Half-pint . . . . . (AA) 2.95
McCoy Midget 10.95
McCoy Complete 19.95
Ohlsson Complete 19.95
Tornado Complete 9.95

SPECIAL SOUVENIR BARGAIN

The manufacturer of a well-known engine, after selling 30,000 at $9.95, has decided to go out of production. We have his remainder of 1,000 complete sets of finished and unfinished castings and parts: Cylinder, piston, piston pin, connecting rod, needle valve, gas line, timer, crankshaft, crankcase, cam, etc., including screws, gaskets, nuts, etc.

You get a complete set, except spark plug and tank. An interesting souvenir of a model engine in the raw for your den or desk.

No. J9 . . . $1.00 per Complete Set

SPECIAL BARGAIN IN PROPELLERS

15 ASSORTED FOR $1.00

We have purchased 50,000 assorted gas model propellers from the country's largest prop manufacturer.

They are ALL PERFECT and range from Champion semi-finished (listing at 5 for $1.00) to finished and lacquered props that sell up to 45¢ each separately. Various pitches, in sizes from 7" to 14".

No selections, please, but we will send you a fine assortment of 15 for $1.00, if accompanied by an order for anything advertised in this magazine. MONEY BACK GUARANTY.

Propeller Sale—8 For $1.00

We don't believe in hoarding, but you won't get a bargain like this anywhere else.

By making a tremendous purchase, AHC has acquired from Rite-Pitch a fine line of finely finished and lacquered high grade, square-tip propellers at a very low price and is passing the savings on to you.

8" 6p.; 8" 8p.; 9" 6p.; 9" 8p.; 10" 6p.; 10" 8p.; 11" 6p.; 11" 8p.; 12" 6p.; 12" 8p.

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FREE

Fine jumbo catalog of thousands of hobby items: Plane, boat, car, engines, accessories, solids, gas, rubber, etc., etc.

10¢

64 page 2 color 9" x 6" catalog, *fully illustrated*. Over 200 free flight and U-Control planes, 100 engines (gas, glo, jet, diesel, Co-2), pages of accessories and supplies, hundreds of rubber powered planes, solids, boats, cars. Over 5000 items. *PLUS* articles on building, doping, flying, engines, etc., etc.

WE HAVE THE NEW GLO-ENGINE HANDBOOK

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Here is a book that tells you *everything* about Glo Engines, what they are and how they work. PLUS everything from selecting your engine to its uses, care and operation. Just read the table of contents.

TABLE OF CONTENTS

- Chapter 1—Theory of Operation.
- Chapter 2—Buying your Engine.
- Chapter 3—Acquainting Yourself.
- Chapter 4—Breaking in Engine.
- Chapter 5—Installation.
- Chapter 6—Flying.
- Chapter 7—Other Uses.
- Chapter 8—Operating Accessories.
- Chapter 9—Trouble Shooting
- Chapter 10—Converting Ignition to Glo.
- Chapter 11—Hints and Helps.
- Chapter 12—Design Features.
- Chapter 13—High Speed Operation.
- Chapter 14—Data Section: Dictionary . . . Fuel Formulae . . . Prop Chart.

TWO OTHER FAMOUS BOOKS

GAS MODEL PLANE CONSTRUCTION

$1.00

A really informative, constructive and USABLE book on the history, theory and practice of U-control planes. 157 pages on designs, controls, construction, power plants and diagrams give all the answers from tools needed to repairing the model. Over 20,000 copies sold.

CONTROL-LINERS-HOW TO BUILD AND FLY THEM

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The only book to completely cover and USABLE book on the subject of building free-flight and U-control model planes. Comprehensive without being technical, the 150 pages and over 200 pictures and diagrams give all the answers from tools needed to repairing the model. Over 20,000 copies sold.

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IT ISN'T OFTEN that you get the chance to buy, at less than half price, a U-Control Plane, Engine and All-Accessory Outfit with your own choice of a well-known FACTORY ASSEMBLED ignition or glo engine. Everything carries the famous America's Hobby Center as well as the manufacturer's guarantee.

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YOUR OWN CHOICE OF ENGINE, PLANE, PLUS ALL ACCESSORIES, INCLUDING: Correct size finished propeller • 3-way plug wrench • Presto Engine starter with handle and cord • Speed indicator tables • Log Book • Motor cover • Spark or glo plug with gasket • Complete engine instructions • 24 page Gas Engine Theory Manual • Engine adjustment chart • Metal fuel tank and gas line • Metal Battery box • Wilco Quality Coil • 12" Hi-tension lead wire and end clips • 18" insulated ignition wire • Ignition slide switch • Coil holder and mount • Everlast condenser • SAE =70 Oil • 4 ignition wiring lugs • Spark plug gauge set • 2 plane identification tags • 72 insignias • GIANT book on Control-liners, How to build and fly them • Cement • Sandpaper • "Pro" all-metal knife and blade • Metal bellcrank with bolt, nut and washer • Elevator horn • Elevator hinges • Lead-in wire • Push-rod wire • U-Control handle • 100 ft U-Control stainless steel wire reel • Membership in Modelcrafters of America • 64 pg 2-color catalog • Postage • Packing • Insurance. Ignition parts not needed with glo-engine not included.

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YOUR CHOICE $12.50

YOUR CHOICE $13.50

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PLUS

TRAIL BLAZER Model Plane with carved lower fuselage-half, fully formed aluminum upper half. Balsa sheet wing, no tissue used. Balsa tail surfaces, plywood engine mount. Schematic drawings with step-by-step plans. Rubber wheels, detail paint schemes. 24" wingspan.

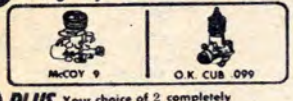
PLUS ALL ACCESSORIES LISTED ABOVE

NEW .099 UNITS

Includes all 3 items

For ease of assembly, for trouble-less operation and for real effortless U-Control flying, these units are the answer to the modeler's dream. Even the beginner will have no trouble in assembling the outfit in one evening and be completely ready to fly the next morning.

1 *You get your choice of*



2 ***PLUS*** Your choice of 2 completely prefabricated kits

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COST ONLY McCoy 9 Glo Outfit $10.95
O K Cub 099 Outfit $ 9.95

AA FLYING OUTFITS

These are the new pint-size glo engines that are so tiny (1 to 1½ ounces) but develop plenty of power for free-flight or U-control flying.

Your own choice

$6.95

$7.45

$7.95

Plus your choice of planes: All planes prefabricated, easy to build and fly

Plus all accessories

5 ACES OUTFIT

The biggest bargain we have ever offered. Over $10.00 of merchandise for only $5.55.

1 *YOUR CHOICE OF*

or


2 ***PLUS*** your choice of 4 prefabricated Scientific 22" span u-control planes.

3 *PLUS ALL ACCESSORIES*

COST ONLY With OK Cub 5.95 / With Spitzy 5.55

BIGGEST BARGAIN OF THE YEAR

READY-TO-FLY OUTFITS

All you do is take the plane out of the box, fill the tank, and FLY. You don't have the fun of building—all the fun's in the flying. Just nothing to build. And to fly, all you'll need extra is fuel and battery. All U-control.

AEROMITE $9.95 A really beautiful red plastic job. 17" wing span with Baby Spitfire engine, prop spinner, tank, etc., already installed. Shock absorbing spring-steel landing gear, Jim Walker U-control for precision and stunt flying, plastic control handle, nylon control cord.

A. J. FIREBABY $7.50 Beautifully finished and painted, even fuel-proofed. 19" span. Includes new "slow-motion" propeller and engine.

BUSTER $7.95 Scale model of Whittman Special. 12½" span K & B Torp Jr. engine already installed.

DOUGLAS NAVY SKYRAIDER $9.95 ... All plastic model including K & B Torp Jr. engine. Landing Gear with aluminum wheels, decals, tank, spinner, etc., etc. Includes nuts and bolts for minor assembly.

YANK $5.95 . . . 23" span championship model. Finished in two colors and fuel proofed. Equipped with O.K. .039 engine and all accessories.

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$6.95 **COMPLETE RACE CAR COMBINATION OUTFIT**

NEW! Scientific's "HALF-pint" race car, complete with direct drive PLUS O.R.049 engine PLUS all needed accessories. Five minutes after you open the package, you can race this car on any smooth surface, even your own backyard or cellar. Speeds over 40 miles per hour. COMPLETE except for fuel (85¢) and storbing battery (80¢). Car alone $2.95.

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A GENERATION OF FAIR DEALING GUARANTEES YOUR SATISFACTION

Showcase

Try your favorite hobby shop for items presented here. Write the manufacturer if you can't find it.

With its new *Wee-Duper Zilch* Berkeley now has a Zilch for just about every size engine in the official competition categories. To keep the record straight here's the run-down: *Mini Zilch,* 20½" wingspan ($1.25) for .02 to .049 engines; *Wee-Duper Zilch,* 34" wingspan ($2.95) for .065 to .099 engines; *Lil-Duper Zilch* ($3.95) for .19 to .29 engines; and the *Super-Duper Zilch* ($5.95) for .45 to .65 engines. The newest Zilch comes as a kit with cut-out wood parts, plywood firewall, formed landing gears, rubber wheels, covering material, complete hardware and full-size, detailed plans. . . .

Some of the first trophies ever designed with specific modelplane theme figures are sold by Russell Brothers Products. In a long, varied line that ranges in price from less than $5 up to more than $150, the concern is able to offer specialized figures to top off trophies including such ones as U-control speed models, free flight models, and jet planes as well as a modeler launching free flight, making an R.O.G. take-off, operating radio-control equipment and the like. A figure of a man flying a U-control model with real flight lines indicates some of the special awards Russell Brothers have worked up. The outfit also handles engraving and has a line of medals of special interest to contest sponsors. . . .

Cleveland Model & Supply Co., which started mass-producing *Great Lakes Trainer* kits back in 1930 re-introduces that famous training plane in prefabricated form at a 1" to the foot scale. This works out to a 27" span model; the kit sells for $5.95. Fuselage and wing construction are of interlocking type. All parts automatically align themselves. Tail surfaces are sheet wood, ready cut to shape. Wing leading and trailing edges are substantial, tapered, shaped and prenotched. Ribs are die-cut. Bulkheads are die-cut and interlock with sheet balsa sides. Along with this Cleveland offers a 28" span *Boeing P-26A* to the same scale, $6.95.

One of the many fine features of an Academy of Model Aeronautics' model flyer's license is the public liability coverage ($50,000 and $100,000 personal injuries; $10,000 property damage). By subscribing to the safety rules of the AMA, you can obtain the license and liability coverage. All licenses are on a calendar year basis, so the sooner you sign up the more you get for your money.

Academy of Model Aeronautics
1025 Conn. Ave., Washington, D. C.

On July 1, '51, I will be..... years old (license classification is based on your age on July 1). Please issue license checked:

Class III—(up to and including 15)..$1 ( )
Class II—(16 through 20).....$1.50 ( )
Class I—(21 years and over).....$2.00 ( )

Name (print) .....

Address .....

City Zone State

(Sign your name below)

(Continued from page 4)

Sure There's a Focke-Wulf FW 198! . . . I have been reading your mag for some time and have never seen you make a mistake so bad as to say that there never was an airplane named the Focke-Wulf FW 198. There was such an airplane and it was flown in Nuremberg, Germany in Sept. 1938. The description is as follows:

The plane is arranged somewhat like a Flying Wing with no fuselage as such. The cockpit nacelle is only large enough to accommodate the pusher engine, the pilot, his control instruments and armament. It is of all-metal construction and is well stressed to take both engine vibrations and firing recoil. It has a teardrop canopy giving excellent visibility. Extended booms

protrude back from the trailing edge of the wing, one boom to each side of the engine nacelle, and carry the control surfaces at their extreme ends. The tail group is cantilever and the horizontal stabilizer and elevator stretches between the booms. Power is supplied by an in-line pusher Daimler-Benz DB 601 of 1,175 hp. giving a top speed of 368 mph at 19,000 ft. Cruising speed is 345 mph and landing speed 76 mph. Span 41 ft., length 31½ ft., rate of climb 2,750 ft./sec., service ceiling 34,505 ft.

Anthony J. Schmidt, Severna Park, Md.

. . . I bought a solid model FW 190 and on the back of the box was a picture of the Focke-Wulf FW 198.

Wally Kasl, Perry, Okla.

. . . I have never written to a magazine before, but when you so bluntly stated that "there was no such airplane as the Focke-Wulf FW 198," it was going too blank far.

Wm. G. Haney, Los Angeles, Calif.

. . . There definitely is such a plane.

Samuel W. Matheny, Millersburg, Ohio

. . . The FW 198 was a single-seat fighter armed with two cannons in the wings and four nose guns . . . My source of information was "Maircraft's" famous planes in miniature.

David Segal, Philadelphia, Pa.

. . . The FW 198 . . . with a tail section similar to that of the Lockheed P-38 . . . with a cabin similar to the one on the Me 110. I enjoy your magazine very much.

Roger Morello, Marseilles, Ill.

• An apology to Mr. Kenneth Hands for telling him that the FW-198 fighter did not exist. This statement drew much mail. We just didn't research back far enough, depending mostly on the German *Flugzeug Typenbuch* for 1944 (Aircraft Types Book) and some AF technical publications. First mention of this aircraft is made in *Jane's All the World Aircraft* for 1940, it is described again in 1941, after which nothing is said of it in subsequent issues. Evidently FW-198 was not a successful airplane and not used for combat. It is even less known than the asymmetrical BV-141 reconnaissance plane, which did see limited service on the Eastern front. Our thanks to the many readers who came across with some interesting information on the FW-198.

Trophy for Hand-launched Gliders . . . After reading your article "Air-Model Design Competition: Balsa Gliders," I would like to add a few ideas and thoughts along that line.

In hand-launched gliders a beginner or novice builder can, for a very small sum, design, construct and fly gliders. Hand-launched gliders can give experience in adjusting model airplanes with little loss of time, effort and material.

Your article incorporated many of the same ideas the Tulsa Glue Dobbers had. In order to further interest in that field, the club decided to offer a perpetual trophy to be awarded at the Nationals. This trophy is awarded each year for the highest total time in hand-launched gliders, regardless of the age or class of the contestant. At the 1950 Nationals in Dallas a junior from Los Angeles won the trophy.

Sgt. Willard H. Kehr, Inactive Pres.
Tulsa Glue Dobbers, Alexandria, La.

Mystery of XB-52 . . . I have read much controversial information on the XB-52. Some say it is dropped, others say it is almost finished. Would you please make clear what is really happening?

I have undertaken to make a list of all the American bombers built between the B-15 and the B-56, but have been unable to obtain data on a few, and would like to know where the information can be had.

Edwin Ewry, Chicago, Ill.

• The Boeing XB-52 has not been dropped. It is still in the construction stage and is scheduled to be put into production.

The best source of info on AF designations and plane specifications dating back from World War I is the book "U. S. Army Aircraft" by James C. Fahey. It sells for $2 and can be purchased from Ships and Aircraft, 2033 Rhode Island Ave., N.E., Washington 18, D. C.

The Very Fastest . . . What is the fastest propeller-driven plane?

Dick Woodworth, Ashland, Ore.

• At the present time, the North American F-51 Mustang holds all speed records for propeller-driven planes. Latest such record was established by Jacqueline Cochran at a speed of 469 mph.

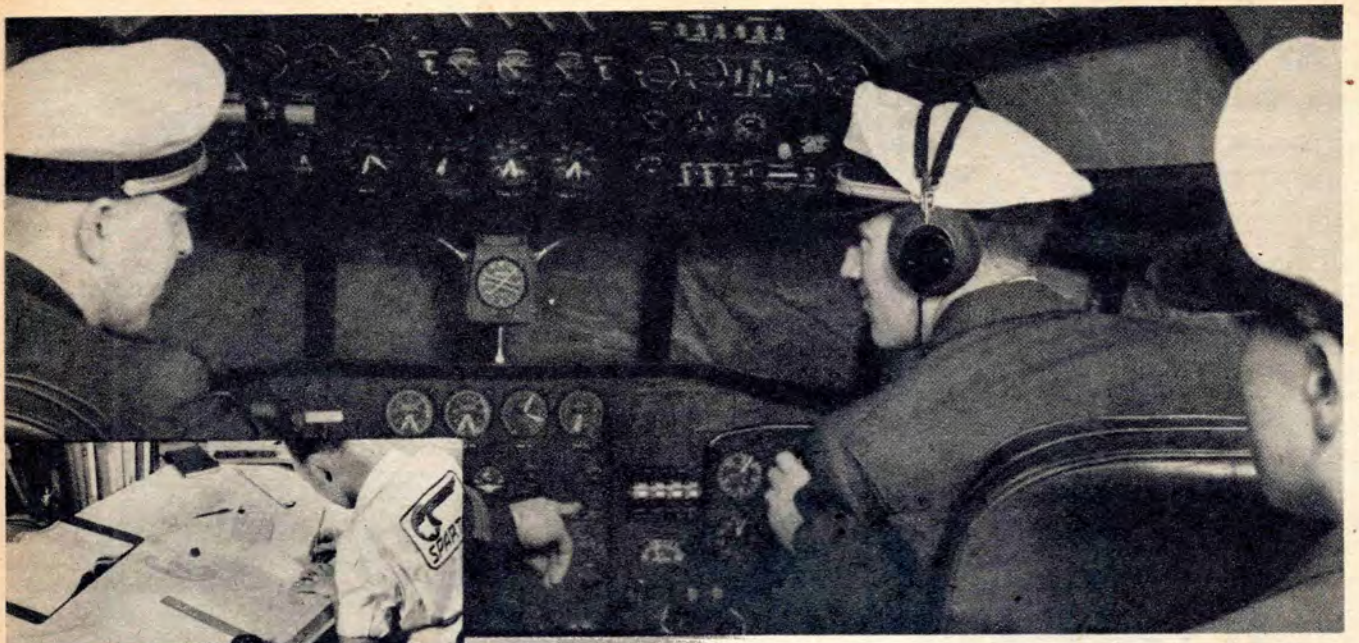
Showcase

Contact your hobby shop for items shown. All information is checked carefully, but is subject to change.

Brand new *X-acto Whittling and Carving Chest* has 17 steel knife blades, gouges, routers, whittler and saw blades for every type of handicraft and hobby need. Features the X-acto knife handle for instant blade changing; non-slip grooving for safe, comfortable working. Every blade is at your finger tip in the handy index-size, fitted wooden chest. The #75 *Leader* set is $5 at dealers everywhere. Polk's Modelcraft Hobbies, 314 5th Ave., New York 1, N. Y. has the complete X-acto line . . .

Hobbyists with a yen for the Old West are latching on to the Austin-Craft line of shelf model kits which now includes a *Wells-Fargo Stage Coach*, a *Covered Wagon* and *Cattleman's Buckboard*. Models are designed from originals in the Pony Express Museum at Arcadia, Calif. Construction features include easy-fastening eyelets that simplify assembly, precision-cut wooden parts, real leather springs, free-rolling plastic wheels and in some model kits—tiny pick-axe, shovel and axe. The Coach and Wagon are $1.75 each in kit form, the Buckboard is $1.25. . . .

Two new Chris-Craft model boats have been "launched" by Scientific Model Airplane Co. Pictured here is the *Riviera* designed for powering with Half-A or A motors. Also takes electric motors. Overall length is 12.5 inches; beam is 4.25 in. Kit comes completely prefabricated with all parts finished. One-piece molded hull is of "Science-Wood" and is brightly painted with hot-fuel-proof paint. Die-cut deck is printed. Kit includes brass propeller, stamped aluminum ventilators, plastic steering wheel, windshield, fuel line, printed instrument panel, gas tank material, printed flags, die-cut motor mount and hardware. $3.50. Companion is the *Chris-Craft Special.*



WHAT are they DOING?

The young men in these pictures are on the jobs for which they trained; good-paying jobs that require skilled hands. Only a few short years ago they only hoped to hold such positions. Study and training was the solution. You can follow in their footsteps. Thousands of new employees are needed in aviation — men with training to build, fly and service the speedier, more powerful and longer-range aircraft. The only limit to your progress in aviation is lack of training and skill.

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air notes | AVIATION TODAY AND TOMORROW

Argentine Jet. The first South American jet fighter recently test flown in Argentina, the Pulqui II, was the brainchild of the famous German designer Kurt Tank, responsible for several successful Nazi high-altitude planes. Tank, who is not only a good designer but an excellent pilot as well, insisted that he test-fly the jet fighter himself. Incidentally, it is rumored that the Soviet fighters MiG-15 and La-17 are based on Tank's design, started in Germany just before its collapse and discovered by the Russian Technical Committee after surrender. It is interesting to note that the Pulqui II bears a marked resemblance to the MiG-15 even to the swept-back wing and high-mounted arrowhead horizontal tail.

Razzle-Dazzle? Much publicity was given recently by the press to the Azon and Razon bombs on the Korean front. These radio-guided bombs were in use during World War II both in the European and Pacific theaters. The mysterious names indicate degree of controllability such as Azon—azimuth only, and Razon—range and azimuth. A big brother, Tarzon, a 27-ft. monster, was pictured in December 1950 AT. All these bombs are controlled by radio signals which actuate hinged tail surfaces.

Another Delta. Another Delta-shaped high-speed research airplane has made its appearance in England. Designed and built by Fairey Aviation Co., Ltd., it is designated as the F.D.1. Considerably smaller than its predecessors, the Avro 707B and the Boulton-Paul P. 111, it has a wingspan of only 19 ft. 6½ in. and length of 26 ft. 3 in. Power is supplied by a Rolls-Royce Derwent jet engine rated at 3,500 lbs. of thrust. Although designed as a tailless craft, the F.D.1 is temporarily fitted with a small tailplane on top of the rudder as a precautionary measure.

Flying by Picture. The plastic canopy which encases the pilot of a high-speed aircraft is almost the only projection which mars the sleek lines of his plane. It also produces friction and heat, and the designers would like to eliminate it. But what would happen if the pilot could not look out? This problem has been the subject of a study conducted by Dr. Stanley N. Roscoe of the University of Illinois and financed by the Office of Naval Research.

Dr. Roscoe suggested that a picture be flashed on a screen either through television or by an optical system such as a periscope from the front of the craft. To test his theory a periscope was installed on a twin-engine Cessna, and a screen in the pilot's cockpit. Windows and certain instruments of the plane were covered, so that the pilot could tell his relation to the horizon and outside world only by looking at the image which appeared on the eight-inch screen in front of him. Eleven pilots of the University's staff flew the plane and found that they could handle it through a standard instrument flight pattern about as well as with windshield vision.

England to New Zealand. The Royal Aero Club of England has announced that an air race from Great Britain to Christchurch, New Zealand, will take place in October 1953. The race is to be divided into two sections, Speed and Transport; both propeller and jet aircraft are eligible. Entry fee will be 100 guineas (approximately $325), half of which is returnable if entrants complete the flight within specified time.

What's in a Name? At a recent meeting of local service air carriers operating under a temporary certificate, it was decided to abolish the name "feeder airline" and adopt the new term "local service airline" as a better and more descriptive appellation.

British Jet-Copter. A 23-place helicopter employing two turbo-jet engines is being developed by the Fairey Aviation Co. in England. The rotors will be actuated by air tapped from the engines to the blade tips. Separate small jet units will also be fitted at tips to give additional power for take-offs and landings. The Rotodyne, as the craft is called, will have a cruising speed of 135 miles per hour.

New Planes for Delta. Delta Airlines, Atlanta, Ga., has ordered a fleet of ten new Convair 340, 300 mph airliners, larger and faster version of the famous 240 Convairliners, 175 of which are in service with a number of air carriers.

Soaring Meet. The Soaring Society of America has chosen Elmira, N. Y., as the site for its 18th Annual National Soaring Contest. The event will be held from July 4 to July 12. The International Soaring Meet may be held in United States in 1952.

New Bailout Technique. When a jet pilot has to bail out from his disabled fighter, he pulls a trigger and is ejected, seat and all, into the 600 mph breeze. The present procedure is for the pilot to remain in the seat as it drops several thousand feet, after which he separates from it and begins using his chute.

However, it was found that the wind blasts cause intolerably high rotation of the seat as well as severe buffeting, making the pilot quite sick. Recently, the Medical Laboratory of the Air Materiel Command conducted a number of high-speed bailout tests and came forth with the recommendation that the pilot should be separated from his seat almost immediately after ejection, and then free fall through the rarified atmosphere of high altitude to a level of sufficient oxygen before his pre-set parachute opens. The oxygen bailout bottle is to be carried on the pilot's body in order to let him avail himself of it during the free fall.

Home for a Heroine. The famous World War II movie queen, Memphis Belle, whose combat adventures were immortalized in the color film of the same name, has been purchased by the city of Memphis, Tenn. The heroic B-17 has been placed on a concrete pedestal.

Your FUTURE began TODAY

In these uncertain, unsettled times, the things you do (or *don't* do) TODAY . . . *right now* . . . will determine, to a large degree, the course of your future tomorrow. How are *you* planning for *your* future? How are you *acting* for your future?

For most young men between the ages of 18 and 25, the prospect of military service seems very likely but an attitude of "sit-and-wait" is dangerous to the security of our country and to your own personal future. Wise young men are acting *now* to gain the skills that will make them better qualified for better jobs in either military *or* civilian life.

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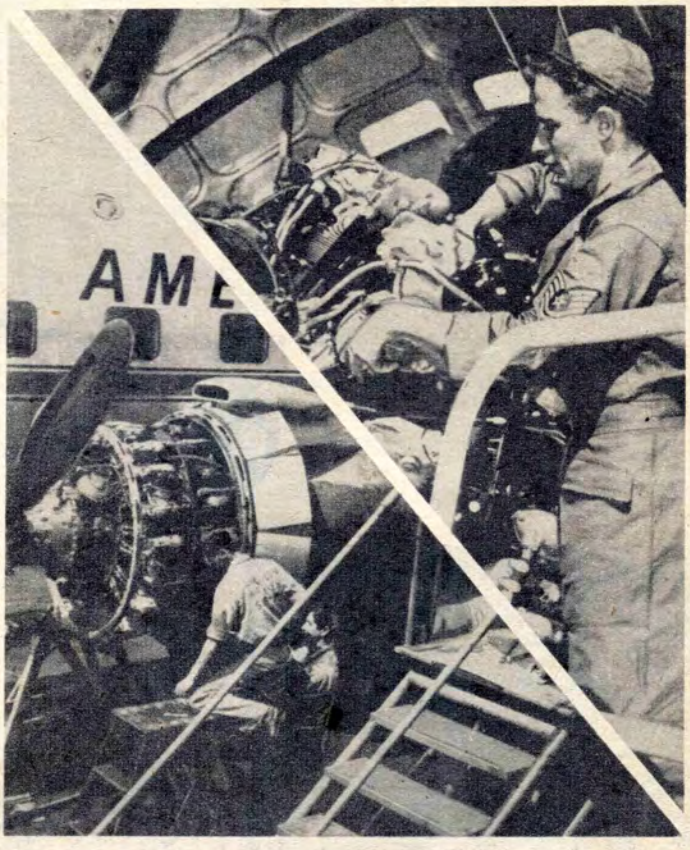

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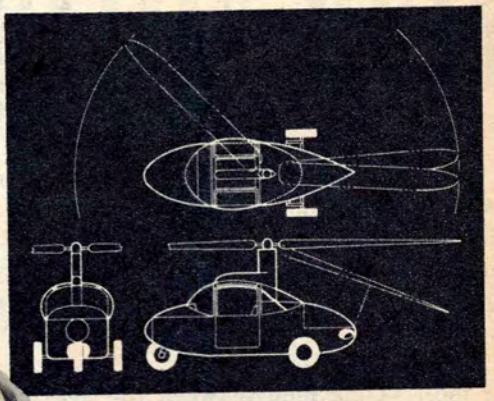
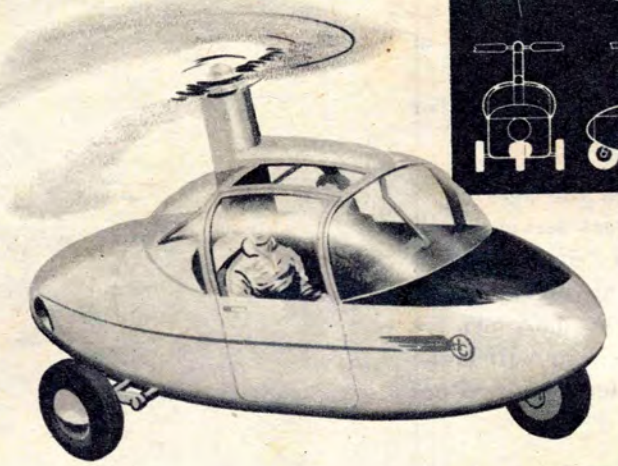
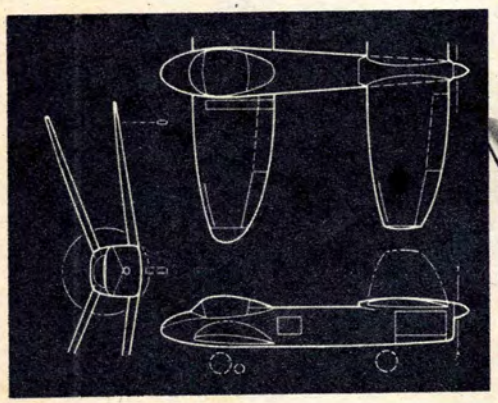
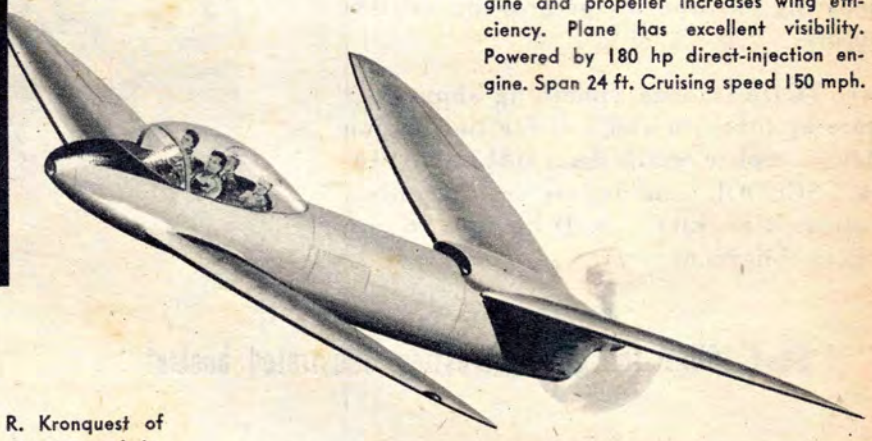
Airmen of Vision
DESIGN COMPETITION





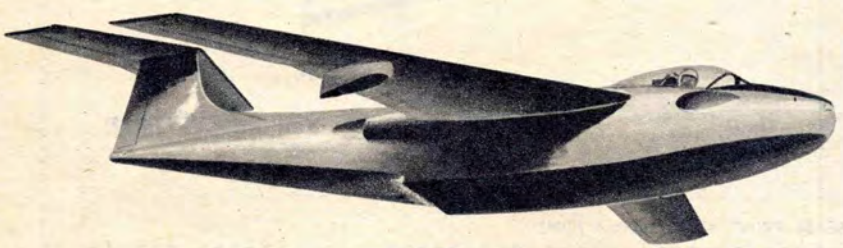
Best design of the month is this roadable, turbo-jet powered helicopter by Douglas Kimura of Chicago, Ill. The 150 hp turbine drives both rotor and wheels. Bifurcated exhaust pipe in rear has deflector vane for controlling rotor torque effect for straight flight and maneuvering. For road use blades fold and are secured to fuselage by retracting strut. Diameter of each blade is 22 feet.

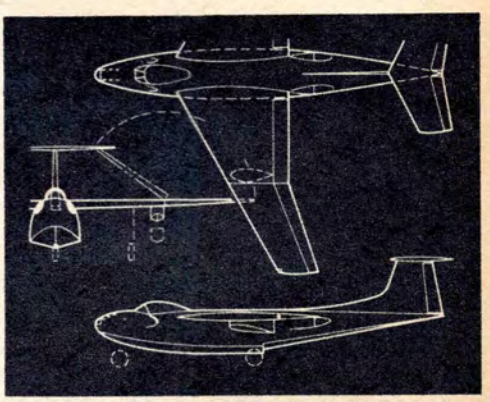




Tandem monoplane by Michael J. Buck of Farnborough, England. Both wings contribute equally to lift, considerably reducing parasite drag; location of engine and propeller increases wing efficiency. Plane has excellent visibility. Powered by 180 hp direct-injection engine. Span 24 ft. Cruising speed 150 mph.

A single-place jet amphibian fighter by Larry R. Kronquest of Los Angeles, Calif. Can operate from carriers, is powered by two 5000 lb. thrust engines. Span 39 ft. Top speed over 600 mph, range 2000 miles. Armament consists of six forward-mounted .50 cal. machine guns, and eight rockets. Wings fold.





Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payments of $5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.

"Dog Fighting" is More Fun

"Dog-fighting" two Firebabies is thrilling to watch and not hard to do if you stay alert. It is especially exciting when you tie a crepe paper streamer to each plane. Each pilot then attempts to cut the other streamer with his prop. The winner is the plane ending the flight with the longest streamer.

Buy it ready to fly, complete with flying lines and full instructions for flying and stunting. Wing span 19 in., weight with motor 3 oz. All parts are finished, painted, fuel-proofed. Just slip them together, bolt on wing and motor, "gas up" and you're ready to take off!

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Supplies fuel under pressure in any position until tank is dry. Complete with Pressure Fuel Tank.
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Air Mobilization

A big Reserve is one of the results expected from the expansion of the services to the 3,500,000 goal now reached—and far more if demanded.

Since the war, the Reserves have left much to be desired. The Navy's is rated best in Congressional statements. The Army and Air Force lacked funds for as many ready units as they needed, so most of the Reservists were unorganized. A majority have done very little.

The Reserves, especially in the Air Force, have been composed largely of officers. As draftees are released from service, however, the plan to hold them in the Reserve for several years will increase the number of enlisted men to millions.

In the Air Force alone, a future reserve of a million or more may be expected. Plans, which were held awaiting the decision of Congress on manpower and UMT, are now going forward. The new Reserve will be divided into "ready" and "standby" components.

Air Reserve and Air National Guard opportunities are now open to those who want a career in the air and want to be sure that they will not be sent to other services after induction.

Guard units have been recruiting for summer training. Check with your nearest unit. There may yet be time to go to camp.

ROTC flying is hoped for in the fall. College students training to be officers have not been given an opportunity to fly till after graduation.

While last year's bill, on which Congress failed to act, would have affected only the Air Force, this year's measure includes authority for any of the services to contract with local civilian airfields for flight training of ROTC students.

The Air Force is expected to use this authority at all its 187 colleges. The Army may also give flight to many students in Artillery, Transportation, and Signal Corps units. With tactical training at Fort Sill, Army ROTC students who learn to fly may graduate as Army Aviators.

The Navy, whose trainees do not specialize in aviation till after they graduate, probably will not give flight training in connection with its college courses. Hence there would be none for the Marines who draw some of the graduates of the Navy's ROTC program.

Training of military personnel is being speeded by Air Force contracts with several major flying schools for basic flying and with aviation operators and colleges for mechanics. Most of the flight training, as in the last war, is in the "good weather" area of the South.

The Navy still is getting all its aviators from the Aviation Cadet program at Pensacola, from which the Marine Corps also fills its needs.

The Army has opened its courses at the new Air Support School, Fort Bragg, N. C., to qualified officers of the National Guard, in recognition of the great importance of air-ground teamwork.

For advanced study, the Air Force Institute of Technology, at Wright-Patterson AFB, announces courses in armament engineering, automatic control engineering, aeronautical engineering, or electronics. As an indication of the increasing technical knowledge required in military aviation, officers with Master's Degree are preferred for these courses.

Stay in school if you can. The old quick check-out and seat-of-the-pants flying have no part in an Air Force bordering on the supersonic.

Civil aviation faces new problems as the war manning and production effort gets into its stride. One would think that all things pertaining to the air would be expanding with the military, since the little airport is where aviation experience begins for so many.

But that is not the way it works. The lightplane industry has been fighting to get enough materials to make 3,000 new civilian planes in 1951—about the same as last year, but not near enough to maintain the civil air fleet of the country at its present numbers.

The "DO" system is being scrapped for the "controlled production" plan which should be quicker in cases of actual defense need.

Civil defense flying is one of the things that long awaited a decision. High officials have been worried about "public apathy" which has surrounded the efforts of the Civil Defense Administration to recruit and train defense volunteers, including air spotters.

One of the principal means of breaking this "apathy" is to use airplanes as they were used in the last war. Civil Air Patrol, first organized as a part of the Office of Civilian Defense, keeps communities on the alert by such missions as mock air raids.

But today's officials do not seem to have read the record of millions of man-days (*Continued on page* 64)

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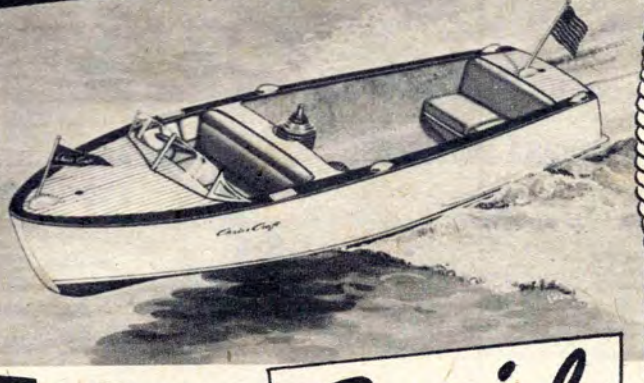
LENGTH 12½" • BEAM 4¼"

One-Piece Hull molded of sturdy "Science-Wood"



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AIR TRAILS
JULY, 1951

Supersonic Killers

The U. S. is developing a new-breed of interceptor to deal with Hi-flying enemy bombers that may try to attack American cities

■ We have a new breed of fighters coming out—and going up—supersonic interceptors! These fast-climbing, sky-rocketing meteorites will flash through the midnight sky in short bursts of supersonic speed to slash and tear at high-flying enemy bombers. Fleets of reserve craft will stand by on the alert, crouching on airport ramps ready to scream off in near-vertical climbs.

We've never had interceptors before. They're purely defensive weapons and we've never needed them. We've always carried the fight to the enemy's homeland with bombers and general-purpose fighters modified to do the

By R. G. NAUGLE

F7U-1 Cutlass

F-88 Voodoo

F-90

F4D-1 Skyray

The present-day interceptor, like the F-94C shown here, is only a stepping stone toward the full-fledged bomber-killer, agile at stratospheric heights and deadly with its rockets and electronic sights

particular job. Some carried drop tanks and escorted bombers over long distances, and then fought off the enemy's defending interceptors over the target. Others, operating by themselves, carried a small arsenal of rocket projectiles, cannon and guns on tactical strikes to break up the enemy's ground defenses, transportation and communication systems.

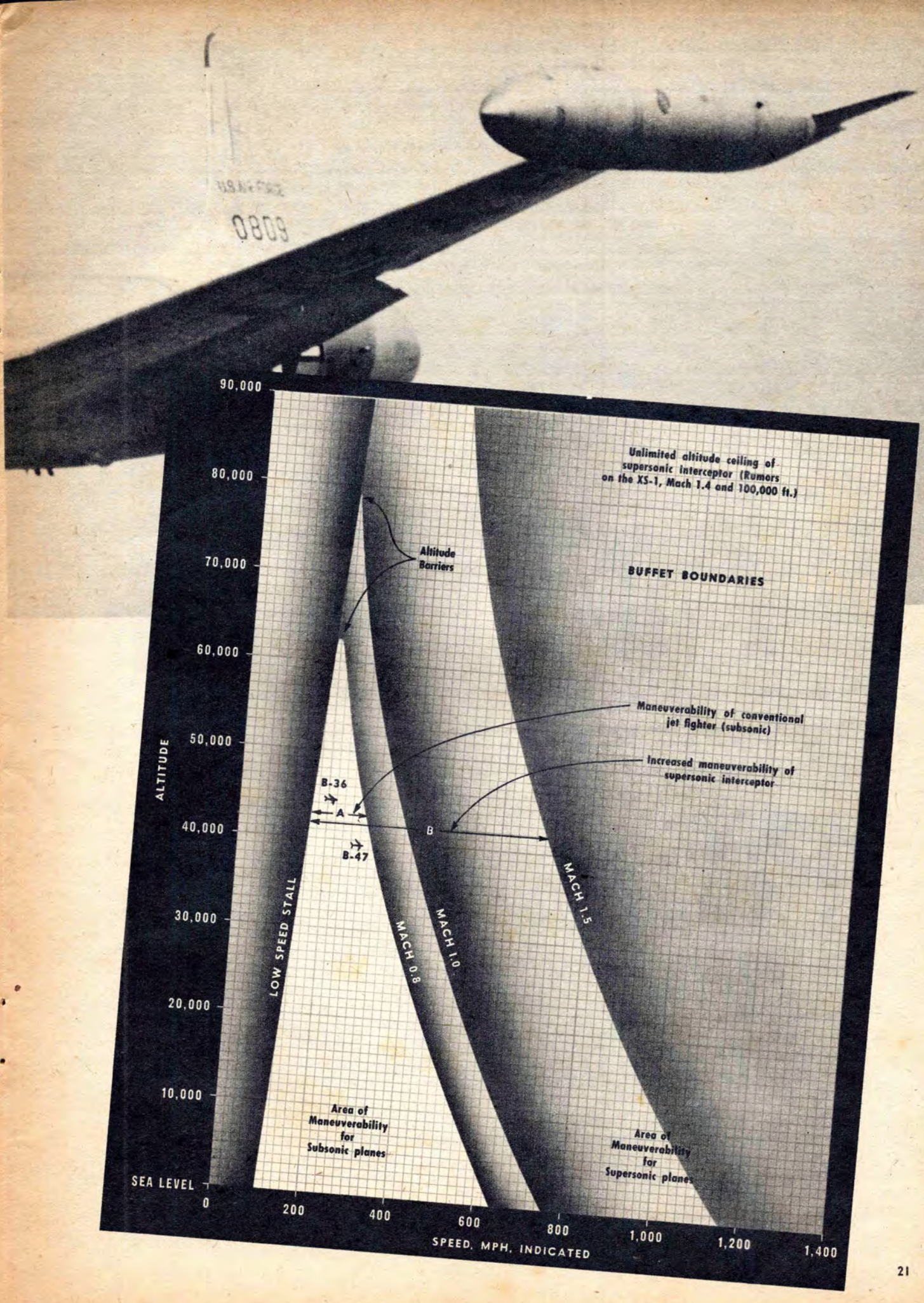
We still need such fighters—penetration fighters, as they are now called. But modern war, like modern football, requires two teams, offensive and defensive. One team to score on the enemy, another to prevent him from scoring on you. We must still have penetration fighters, but we now need and will soon build a huge fleet of fast, goal-line defending supersonic interceptors to prevent enemy touchdowns on the North American continent.

Speed and ceiling of bombers now equal those of fighters since both, in the practical sense, are held back by the sonic barrier. For example, the F-86 and B-47 are not only similar in general design but both have about the same top speed and maximum altitude capabilities. Both fighter and bomber can now closely approach the speed of sound with their thin sweptback wings and jet power, and both can achieve stratospheric altitudes undreamed of during World War II. And herein lies the rub—for fighters must chase, catch and shoot down bombers.

This means we *must* have supersonic interceptors, for not only must they fly faster than the speed of sound to overtake fast modern bombers, but they must also do so *in order to regain their maneuverability at extreme altitudes!* This is not generally appreciated. But a simple chart shows it quite clearly.

It is the chart of speed versus altitude that positively defines the limits *any* subsonic airplane must fly within. We know that an airplane must fly so fast to stay in the air—the normal low-speed stall. On the other hand, a subsonic airplane cannot fly faster than its critical Mach number—some fraction of the speed of sound. "Buffeting" occurs in both cases, a breakdown of airflow over the wings and the sudden loss of lift. Therefore these limiting speeds are called the "buffet boundaries." If these speeds remained the same at all altitudes a plane could fly as fast and have the same maneuverability at high altitudes as it does near the ground. But they do not remain the same.

The stalling speed tends to *increase* with altitude while the critical Mach speed tends to *decrease* with altitude—thus squeezing the flyable speed range together until, at some altitude, the stalling speed equals the critical Mach speed. The altitude at which this occurs is sometimes called the "altitude barrier" since an airplane cannot fly any higher than this. The airframe as a heavier-than-air machine can no longer support itself in the air and fly as an airplane above this point. Power is not a factor. While considerable power is required for a plane to approach its altitude (*Continued on page* 56)


90,000
80,000
70,000
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50,000
40,000
30,000
20,000
10,000
SEA LEVEL
ALTITUDE
0
200
400
600
800
1,000
1,200
1,400
SPEED, MPH, INDICATED
Unlimited altitude ceiling of supersonic interceptor (Rumors on the XS-1, Mach 1.4 and 100,000 ft.)
Altitude Barriers
BUFFET BOUNDARIES
Maneuverability of conventional jet fighter (subsonic)
Increased maneuverability of supersonic interceptor
B-36
A
B
B-47
LOW SPEED STALL
MACH 0.8
MACH 1.0
MACH 1.5
Area of Maneuverability for Subsonic planes
Area of Maneuverability for Supersonic planes

HUP-1, a smaller, all-metal version of the Flying Banana. Powered by a 525 hp air-cooled radial Continental engine, it was recently ordered by the Navy for a variety of fleet uses. Rotor blades fold to facilitate below-deck storage. Useful load in excess of 1500 lbs.

"Pi" and the Flying Banana

By WM. S. FRIEDMAN

A latter-day Horatio Alger story of a model builder who became a leading plane manufacturer at 31

■ "For outstanding contribution to the design and development of Helicopters"—so read the citation for the world-famed Lawrence Sperry Award that the Institute of the Aeronautical Sciences gives every year for notable contribution to the advancement of aeronautics by a young man. The distinguished audience of some eleven hundred which crowded the main ballroom of New York's Hotel Astor seemed pleased with the selection, as white-haired "Dutch" Kindelberger, the 1950 President of the Institute, presented the award to a dapper youngster, scarcely thirty-one, named Frank Nicholas Piasecki.

Frank Piasecki is the hero of a modern success story, and his, the tale of a nation that is still quick to recognize merit in a tangible form.

Born in Philadelphia in 1919, the only child of an immigrant tailor, young Frank grew up in the normal pattern of American kids. He early showed a talent for music, and his father had visions of his becoming

a concert violinist, but the time and the locale were wrong. The boy lived in the vicinity where men like Harold Pitcairn, E. Burke Wilford, Wally Kellett, Dick Prewitt and others were building aircraft with wings that whirled around instead of standing still.

The autogiros of the late Twenties and early Thirties made local headlines, and young Frank spent a lot of time over at Willow Grove and other places, watching pioneers like Jim Ray and Lou Levitt creating history in the rotating wing. Then the elder Piasecki made another tactical error, if he really wanted his son to become a violinist. He bought him a model airplane kit, and Frank proceeded to put the rubber-band powered aircraft together. While the discipline of a carefully knit family would not permit the precious violin to be neglected, somehow the youngster's interest in music was never quite as keen after that first model flew.

Frank or "Pi," as his school chums named him, was one of the leading model builders of the neighborhood during his high school days. He never got into serious model competition, because he felt even then that rotating wing aircraft was the key to the solution of many of aviation's thorniest problems. After graduating from high school, he went to work for the Kellett Autogiro Corporation as a pieceworker on a stamping machine. Here, he worked himself out of a job by doing his so efficiently that he cleaned up all the required pieces in a few weeks.

By 1936 Pi had set aside enough money to enter college. He did part of his undergraduate work at the Towne School at the University of Pennsylvania. Just previous to matriculation, he found employment with the Aero Service Corporation making surveys and maps from aerial photographs. This job he held on to during week-ends and summer vacations until 1938 when he transferred to the Guggenheim School of Aeronautical Engineering at New York University. And during those summer vacations, between his junior and senior years, Pi worked as a design engineer for the International Staple and Machine Company of New York.

It was at the New York University that Pi got under the wing of the beloved Prof. Alexander Klemin. The classic tale would have been that of the obedient student with his Mentor—but not Pi. While the noted aeronautical scholar was quick to appreciate the young Philadelphian's latent genius, he tried to steer him away from unconventional designs. Dr. Klemin had seen some of the great minds of his time virtually lose their way in the vastness of the problems of rotating wing aircraft. The renowned Dr. de Bothezat, once senior aerodynamicist for the Army, had expended much of his energy along these lines and never seen any practical results. His friends had spent fortunes on the autogiro, and never evolved a commercially feasible vehicle to show for it.

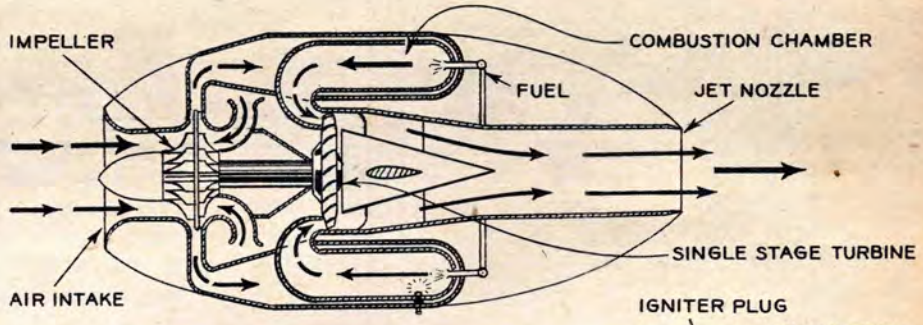
One morning, Prof. Klemin was wandering over the green Campus of N.Y.U. uptown when he spotted young Piasecki with a rubber-band helicopter in actual flight. "What are you doing, young man?" the professor asked. "I'm working on my thesis," Pi replied. The teacher feigned annoyance. "What has this to do with the subject of the balancing tab which I assigned to you?" Said Pi: "I know Professor, but this is more interesting." Naturally, Pi was reproved for his deviationism, but Dr. Klemin allowed him to go ahead. The young man's thesis, "The Principles of Vertical Flight," is still regarded as one of the best presentations of primary rotating wing principles written up to that time.

If there was ever a model PV-1, it was one of the rubber-band helicopters that Pi built during this thesis-writing period. There was actually a full set of helicopter designs created during Pi's last year at N.Y.U., but they never (*Continued on page* 67)

Here's "Pi" at controls of one of his HRP-2 ten-place helicopters. A seasoned rotor pilot, he frequently test-flies his own designs.

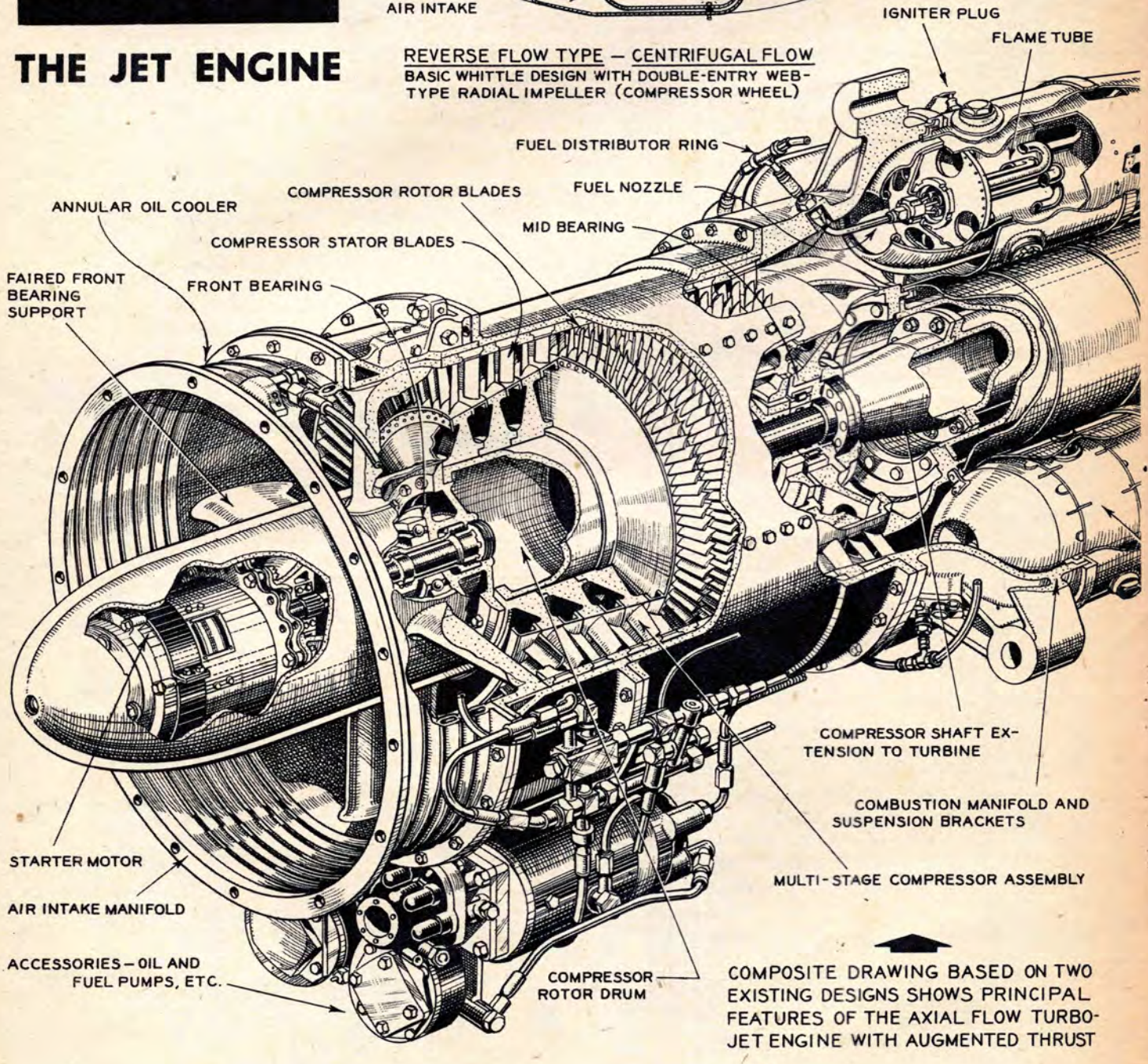
AIR PROGRESS

By DOUGLAS ROLFE



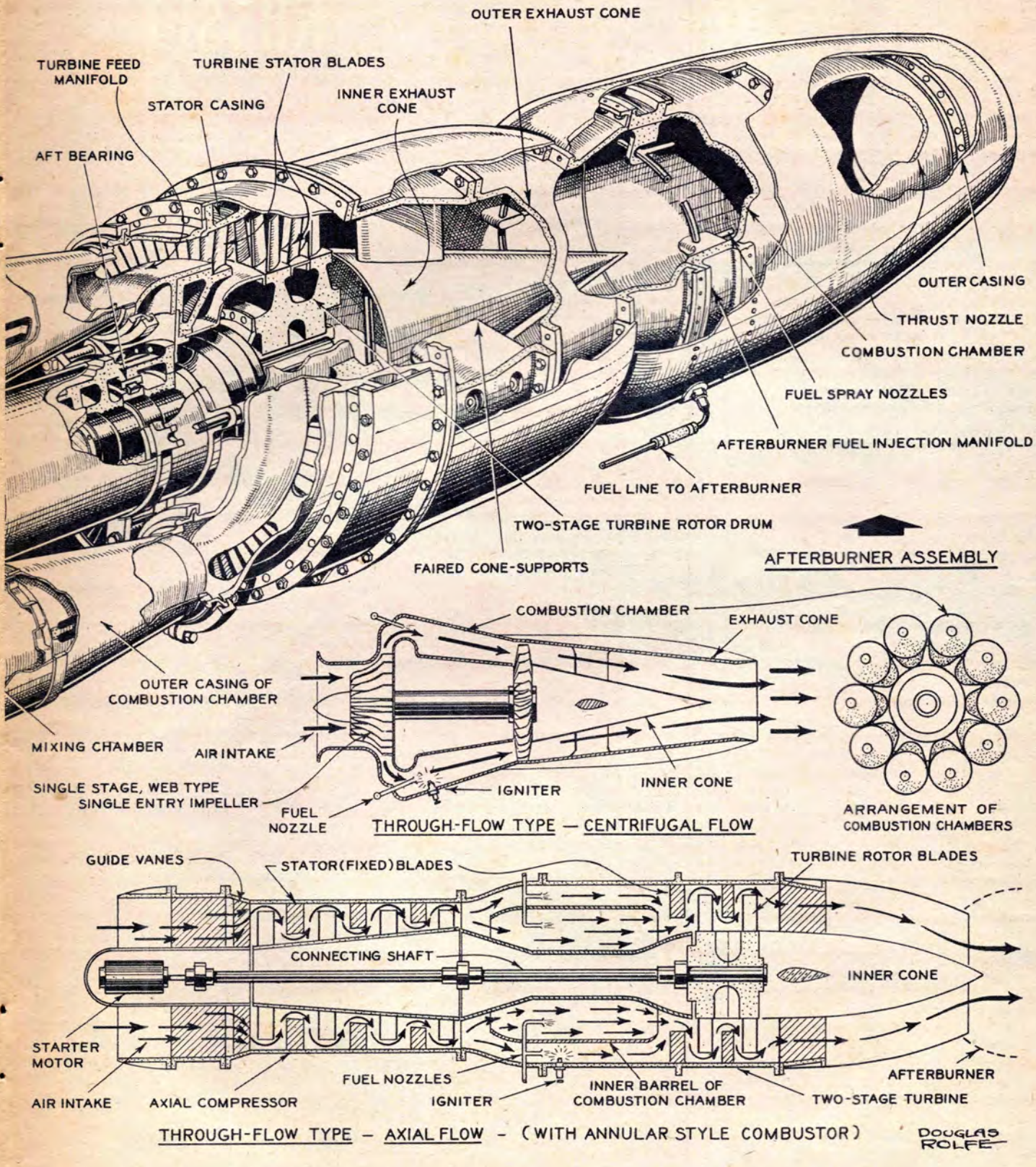
THE JET ENGINE

REVERSE FLOW TYPE — CENTRIFUGAL FLOW
BASIC WHITTLE DESIGN WITH DOUBLE-ENTRY WEB-TYPE RADIAL IMPELLER (COMPRESSOR WHEEL)



COMPOSITE DRAWING BASED ON TWO EXISTING DESIGNS SHOWS PRINCIPAL FEATURES OF THE AXIAL FLOW TURBO-JET ENGINE WITH AUGMENTED THRUST

The first practical turbo-jet engine was born in England in April 1937. It was a far cry from the present-day mighty powerplants which develop over 10,000 hp and are capable of pushing a fighter to a speed of over 600 mph. The creator of the engine was an RAF officer, Frank Whittle, now Air Commodore, the man who revolutionized aviation's powerplant field. It is true that the Germans made the first short hop with a jet-propelled Heinkel He-178 powered by a Heinkel jet engine two years before the Gloster E28/39 plane powered by the Whittle plant took to the air, but the Nazi engine was abandoned and flights with a different type were resumed after the Gloster was flown successfully. Whittle's jet was progressively improved and it was this type that eventually flew the first U. S. jet fighter, the Bell P-59 Airacomet. As



seen from these illustrations, there are several types of turbo-jets. The two main ones are the centrifugal and the axial flow. The centrifugal has a compressor consisting of a single impeller, while the axial flow has several located one behind the other and separated by stationary or stator blades which act as diffusers. Some engines also have multiple-stage turbines. The centrifugal type is further subdivided into reverse flow and through flow types, as illustrated here. The only advantage of the reverse type is the reduction of overall length and shortness of the shaft which joins the compressor with the turbine. Because gases have to make a complete reversal before they strike the turbine, there is considerable power loss. In fighters, the afterburner is used to increase power by 40% for short bursts of speed.


Russia—
41
40170
41
41
41
FRANK TINSLEY

Colossus of the Air PART III

By "ARGUS"

■ The first of Russia's swept-wing interceptor fighters, the MiG-15, which has appeared over Korea in some numbers flown by Sino-Communist Air Force pilots, has been the subject of a spate of sensational articles in the less technical sections of the world's Press. Flying across the Yalu River from their base at Autung airfield, just inside Manchuria, these MiG-15s have been enthusiastically credited with 700 mph top speeds. But, exaggeration and sensationalism apart, the MiG-15, which is receiving its operational shake-down in Korea in much the same way as the Germans and Italians tested their latest equipment in the Spanish Civil War, is undoubtedly an advanced fighter and its appearance should act as a reminder that we do not possess any exclusiveness in the design of ultra-modern combat airplanes.

There are those who would try to persuade us that the relatively small quantities of this fighter that have appeared in various sections are purely for show purposes and that the type is not as yet widely used by the Soviet Air Force itself. How can these dangerous optimists explain away the indisputable fact that many hundreds of MiG-15s are available to the Soviet Air Force in the Eastern Zone of Germany? The runways of airfields at Grossenhain, Brandis, Laerz and Finow are lined with these fighters. A reporter who succeeded in breaking through the barriers at the Laerz Airfield one foggy night and hid there until dawn in order to take photographs, said in describing his adventure:

"At dawn the fog cleared and there, near enough to be touched were one hundred and fifty to one hundred and eighty Soviet jet fighters of the MiG-15 type. I photographed some. Later I tried to take them during take-off but it was impossible. They left the ground and climbed at an angle of 45 degrees.

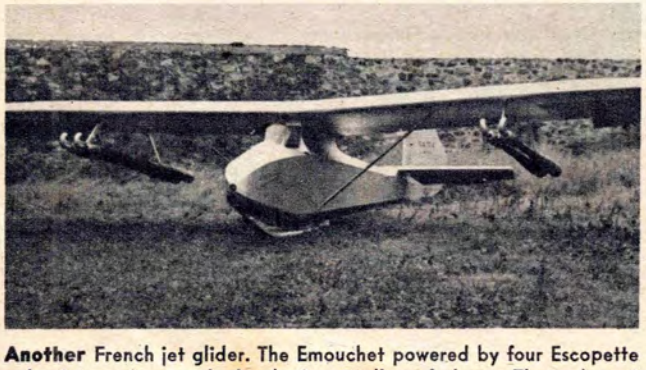
"At the end of the airfield a goods train rolled in laden with huge yellow cases the size of a whole carriage. The same cases were already on the field in rows, but painted in camouflage colours. In these cases the jet fighters arrive by train from Russian plants. In Laerz they are assembled and tested."

When the MiG-15s returned from their morning test hop (which consisted of flying round and round the perimeter of the airfield in order that they would not be seen by prying eyes) he succeeded in taking a number of photographs of the fighters landing, and these shots confirmed every detail of the drawings published with a foregoing article in this series. It is rumored that the MiG-15 is to be delivered to the air arm of the East German Communist "Peoples' Police" which is intended to reach a final strength of 400,000 men. This new German Air Force, Soviet sponsored and trained, consists largely of ex-Luftwaffe pilots, and the first formations are to be formed *this* spring. The very fact of the existence of these MiG-15s in Germany refutes the optimists.

Designed by Artem I. Mikoyan and Mikhail I. Gurevich, the MiG-15 first began to enter service with the Soviet Air Force in 1948. It is a small fighter with a mid-set 35-degree back-swept wing spanning only 33 feet—the same as (*Continued on page* 58)

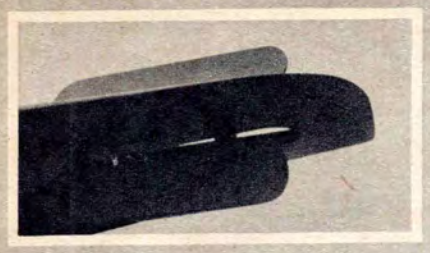
Helicopter newcomer. Two-place twin rotor McCulloch MC-4 by McCulloch Motors of Los Angeles, Calif., powered by 165 hp six-cyl. aircraft engine. Several will be built for Navy for evaluation tests.

Development Highlights

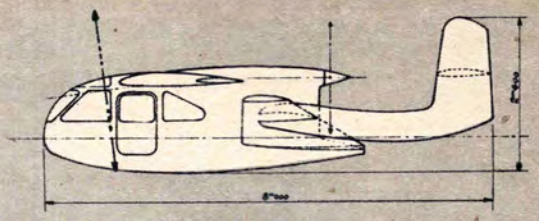


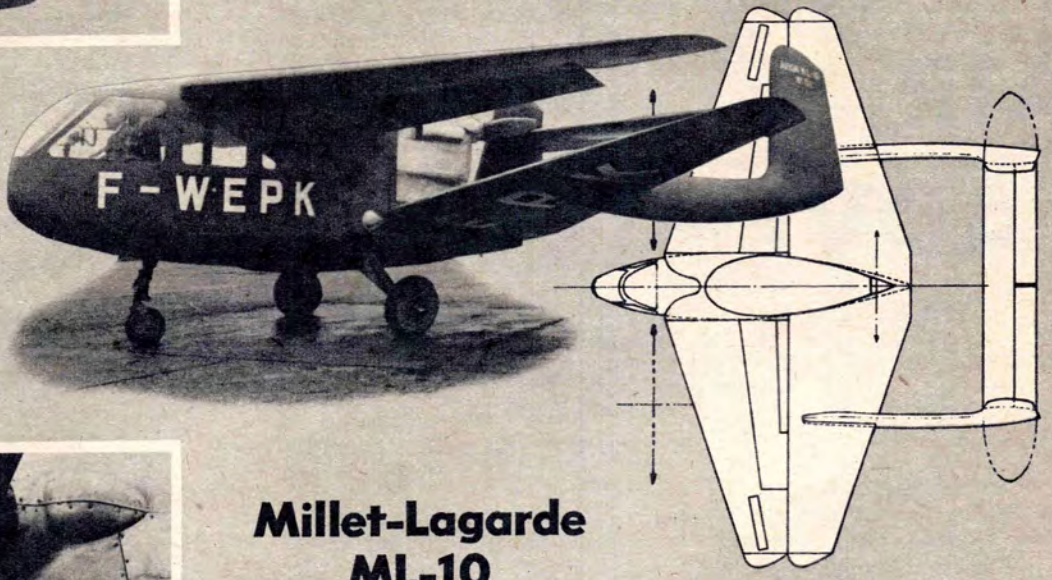
Another French jet glider. The Emouchet powered by four Escopette pulse jet engines each developing 22 lbs. of thrust. These do not use mechanical valve for power cycle; depend on turbulance for it.

A French experiment in very high aspect ratio wing planes, Hurel Dubois HD-10. Aspect ratio is 32.5 to 1, wingspan 40 ft., wing chord 15.75 in. Powered by 75 hp engine. Ship flew successfully.

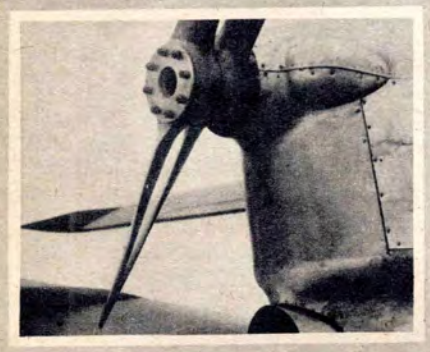


Spoilerons





Slotted prop

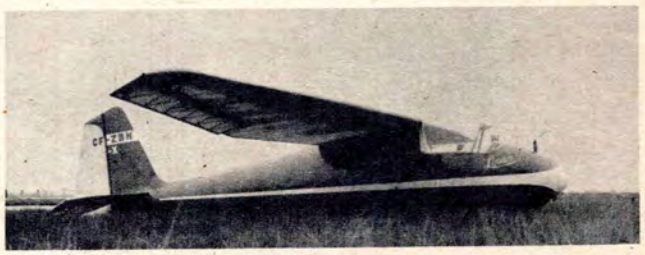


Millet-Lagarde ML-10

An interesting approach to a stallproof airplane appeared recently in France designed and built by two engineers, M. Millet and J. Lagarde. Close-coupled biplane wing gives effect of slot which can be varied by the flap, connected up to the elevator. Spoilers on top of wing act as ailerons.

A fixed-pitch slotted propeller reduces the take-off run by 20% as compared to standard variable pitch screw. The ML-10 has proved exceptionally stable, the prototype making accurate landings at 31 mph. Because of slotted effect of biplane wing, lift is maintained up to an angle of 32 deg.

Lockheed 1049, Super-Constellation. Fuselage eight and a half feet longer than standard Connie, can carry 100 passengers, and has 3,500 hp engines. Eastern Airlines ordered 14 Super-Connies.



UTG-1 Loudon sailplane, designed and built by University of Toronto, holds the Canadian distance record with a flight by Frank Brame of 118 mi. from Toronto to Kingston. Good performance.

The Beaver in uniform. The popular Canadian bush plane designed and built by deHavilland of Canada will be used by USAF for liaison duty, designated as L-20. Has a P&W 450 hp engine. Span 48 ft.

SE-2410 Grognard, French, single-place twin jet fighter, has air intake scoop above and behind pilot cockpit, giving it hunchback appearance. Engines are Rolls-Royce Nenes built by Hispano-Suiza.

AIR ADVENTURERS CLUB

■ To recruit members or get help for your local Air Adventurers unit, there is one convincing proof above others as to the importance of this sort of thing.

It is in what volunteer air training has meant to other nations—and what it means now to the Reds.

Even now, many of our officials think of model building as just a young people's hobby. Models in some circles are classed as *toys!* Just toys, like the models that Nazi youngsters flew before the last war . . . and the gliders in which they rose over the valleys on warm thermal-filled Sundays.

Only harmless toys, until the young flyers graduated into the Luftwaffe. Manned from an area little bigger than Texas, this force nearly won the war.

All this was carefully planned, we now know from the captured German records. Of all the Hitler youth movements, the "NSKF," for aviation, was the elite corps. Out of it, boys with pilot aptitude went on to flying, while many others were screened into the equally important ground service duties.

Against it, men like Gill Robb Wilson, who traveled in Germany and spoke the language fluently, tried for years to get backing for a countering movement, American style. As the founder of Civil Air Patrol, this was part of his plan.

While Canada had an air cadet movement as a feeder for the RCAF, and while England and France sponsored some such activities, the United States made little or no effort to encourage its aero-modelers officially till after World War II.

Big as the German effort was, it probably was dwarfed by what the Russians started long before. Throughout the Soviets, millions of "volunteers" were organized to train for military service, guerrilla fighting, and civil defense.

The name of this system was the "OSOAVIAKHIM," an abbreviation for "Society for Aid in Defense and Aviation-Chemical Upbuilding of the USSR."

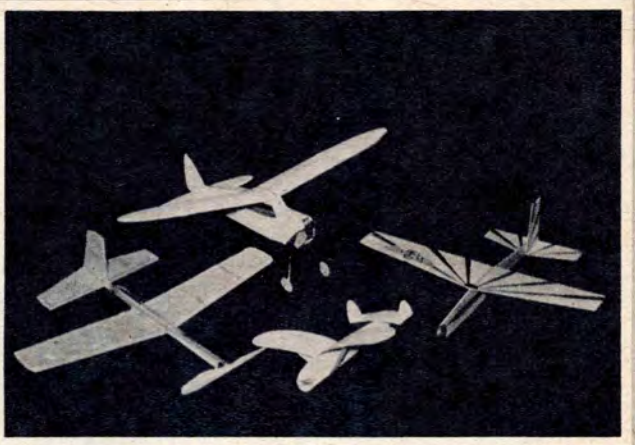
According to a report in 1941, there were then 7 or 8 million Young Pioneers, between 10 and 16, getting defense education from the OSOAVIAKHIM. Model building and flying clubs were an important part, along with parachute jumping towers and instruction in weapons.

Contrast a movement of this scope with the Civil Air Patrol Cadet Program, the only comparable official movement in this country, (*Continued on page* 62)

Airplane photo fan is AA'er Wallace Bielicki, 13, Detroit, Mich. Wally hopes to be a pilot someday; here he is with some of his best air pix.

David Griscom, 12, Pittsburgh, besides building models is a real collector: rocks, shells, insects and feathers; likes chemistry.

Fourteen-year-old Kent Mitchell lives in Hagerstown, Md., near the Fairchild plant. Hence this fine shot he took of the XC-120 *Pack Plane*. An Air Scout, he aspires to be air mech or pilot.



How's this for a nice collection of A-A training models? Charles Zimmer of Worthington, Ohio, turned these out. The A-A insignia on balsa glider is of Trim-Film. Charlie wants to be aero engineer.

Another full-size plane photo fan is Fred Moore, 15, Emporium, Pa., who snapped the Continental racer *Lil Rebel* at Sharon, Pa., during air show. Fred's a member of Piston Pushers Model Flying Club.

John J. DiBiase of Hawthorne, Calif., a student at the Northrop school, used the Club as the theme of a talk before his English class and received a top grade! Here John stands before a Cessna.

Join Air Adventurers Club and do your part in making America air conscious; use coupon below

AGE LIMITS: There are no minimum or maximum age limitations on Air Adventurers Club membership.

MAIL TO: Air Adventurers, c/o Air Trails, 304 East 45th Street, New York 17, N. Y. Print all information required on the application; sign where indicated. *At same time,* print your name and address on both labels and mail with coupon.

I hereby apply for membership in the Air Adventurers Club and promise to do everything in my power to uphold the principles of the organization and work for the advancement of American aviation. I enclose 25¢ in well wrapped coins for my credentials ☐; 50¢ for credentials *and pin* ☐—(indicate which).

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Print your name & address on both these forms and mail inside the envelope with your application form; they will be used as labels for mailing

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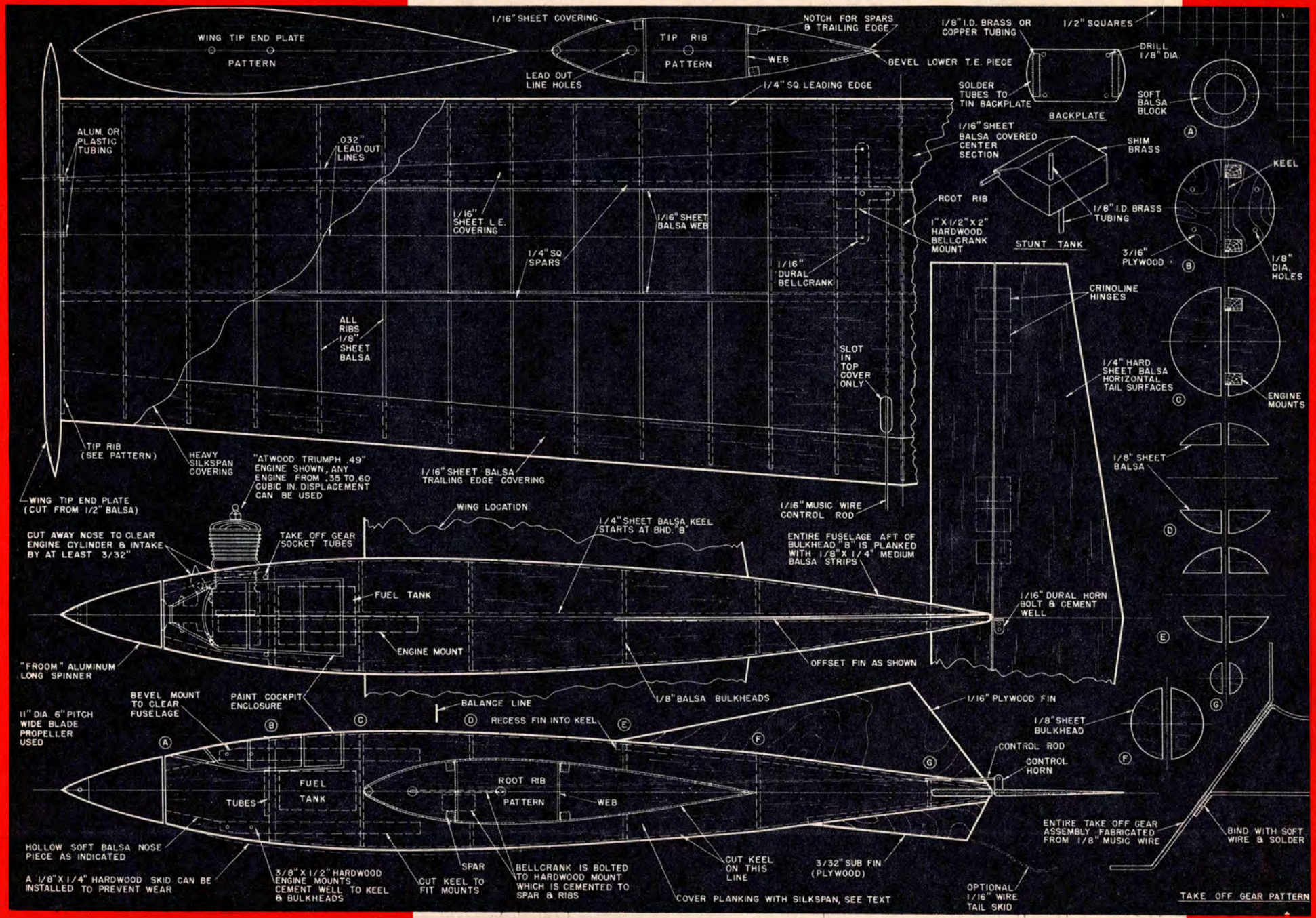

WING TIP END PLATE
PATTERN
1/16" SHEET COVERING
TIP RIB
PATTERN
NOTCH FOR SPARS & TRAILING EDGE
WEB
BEVEL LOWER T.E. PIECE
LEAD OUT LINE HOLES
1/4" SQ. LEADING EDGE
1/8" I.D. BRASS OR COPPER TUBING
1/2" SQUARES
DRILL 1/8" DIA.
SOLDER TUBES TO TIN BACKPLATE
BACKPLATE
SOFT BALSA BLOCK
A
ALUM. OR PLASTIC TUBING
.032" LEAD OUT LINES
1/16" SHEET BALSA COVERED CENTER SECTION
SHIM BRASS
KEEL
ROOT RIB
1/16" SHEET L.E. COVERING
1/16" SHEET BALSA WEB
1/8" I.D. BRASS TUBING
1" X 1/2" X 2" HARDWOOD BELLCRANK MOUNT
STUNT TANK
3/16" PLYWOOD
B
1/8" DIA. HOLES
1/4" SQ. SPARS
1/16" DURAL BELLCRANK
CRINOLINE HINGES
ALL RIBS 1/8" SHEET BALSA
SLOT IN TOP COVER ONLY
1/4" HARD SHEET BALSA HORIZONTAL TAIL SURFACES
C
ENGINE MOUNTS
TIP RIB (SEE PATTERN)
HEAVY SILKSPAN COVERING
"ATWOOD TRIUMPH .49" ENGINE SHOWN, ANY ENGINE FROM .35 TO .60 CUBIC IN. DISPLACEMENT CAN BE USED
1/16" SHEET BALSA TRAILING EDGE COVERING
1/8" SHEET BALSA
WING TIP END PLATE (CUT FROM 1/2" BALSA)
WING LOCATION
1/16" MUSIC WIRE CONTROL ROD
CUT AWAY NOSE TO CLEAR ENGINE CYLINDER & INTAKE BY AT LEAST 3/32"
TAKE OFF GEAR SOCKET TUBES
1/4" SHEET BALSA KEEL STARTS AT BHD. "B"
ENTIRE FUSELAGE AFT OF BULKHEAD "B" IS PLANKED WITH 1/8" X 1/4" MEDIUM BALSA STRIPS
D
FUEL TANK
1/16" DURAL HORN BOLT & CEMENT WELL
E
ENGINE MOUNT
"FROOM" ALUMINUM LONG SPINNER
OFFSET FIN AS SHOWN
BEVEL MOUNT TO CLEAR FUSELAGE
PAINT COCKPIT ENCLOSURE
BALANCE LINE
1/8" BALSA BULKHEADS
1/16" PLYWOOD FIN
11" DIA. 6" PITCH WIDE BLADE PROPELLER USED
A
B
C
D
RECESS FIN INTO KEEL
E
F
G
1/8" SHEET BULKHEAD
CONTROL ROD
CONTROL HORN
FUEL TANK
TUBES
ROOT RIB
PATTERN
WEB
ENTIRE TAKE OFF GEAR ASSEMBLY FABRICATED FROM 1/8" MUSIC WIRE
BIND WITH SOFT WIRE & SOLDER
HOLLOW SOFT BALSA NOSE PIECE AS INDICATED
A 1/8" X 1/4" HARDWOOD SKID CAN BE INSTALLED TO PREVENT WEAR
3/8" X 1/2" HARDWOOD ENGINE MOUNTS CEMENT WELL TO KEEL & BULKHEADS
SPAR
CUT KEEL TO FIT MOUNTS
BELLCRANK IS BOLTED TO HARDWOOD MOUNT WHICH IS CEMENTED TO SPAR & RIBS
COVER PLANKING WITH SILKSPAN, SEE TEXT
CUT KEEL ON THIS LINE
3/32" SUB FIN (PLYWOOD)
OPTIONAL 1/16" WIRE TAIL SKID
TAKE OFF GEAR PATTERN

STUNT ROCKET

By W. A. MUSCIANO

Designer Musciano with his giant; upright ignition motor was early experiment.

■ The *Stunt Rocket* is an outstanding example of the application of modern styling to a proven force arrangement for competition stunt models. Its large size (550 square inches) is a departure from "mosquito" stunt models.

Instead of attempting realism by means of a bubble canopy (à la military motif) or open cockpit (prewar private plane type), we omitted these creators of parasite drag and painted a flush cockpit in the nose section similar to the more recent full-scale rocket research planes. The projectile fuselage profile coupled with the Froom needle nose spinner completes the illusion of a supersonic rocket plane with the assistance of the rakish fin.

In view of the fact that the wing is the main structure, it is first on the list to be fabricated. Only the tip and root rib patterns have been given on the plan. These should be cut from the specified stock; then cut rectangles to the rough dimensions of the remaining ribs. Spot-cement these rectangles to each other with the root and tip ribs at either end. Now carve the ribs to shape using the tip and root ribs as patterns.

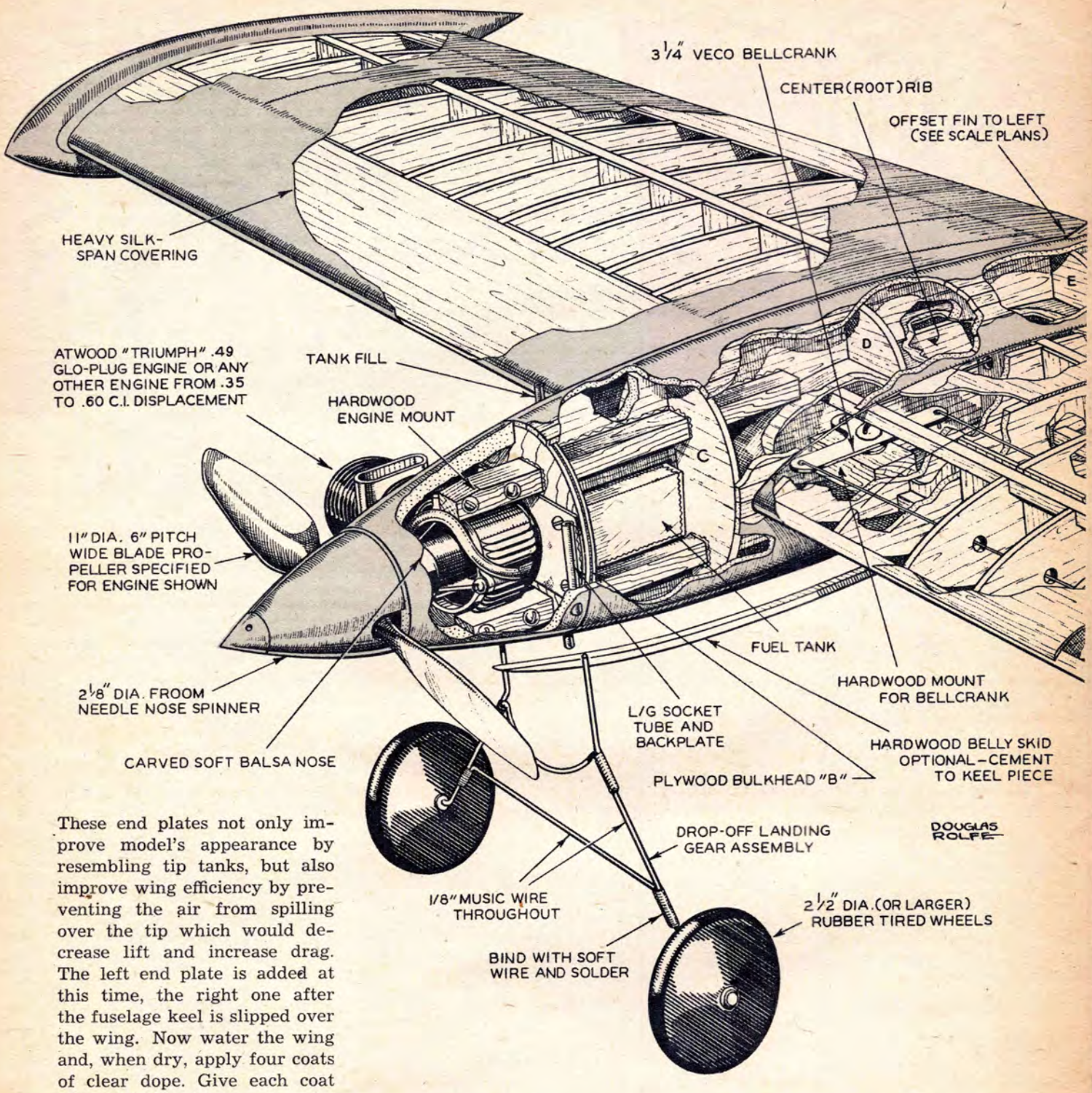
It will be noted that the leading portions of all ribs up to the front spar are identical. Notch the ribs for spars, leading edge and sheet covering. The forward bottom spar is pinned to the workbench directly over a full-size plan and the ribs cemented to it. This bottom spar must be raised from the workbench 1/16″ with slivers of balsa before the ribs are attached. Cement the top spar in place and add the leading edge. Add the rear top spar and top trailing edge piece; do not twist wing structure during this operation. When dry remove the structure from the workbench, bevel top trailing edge piece as indicated, and cement the remaining spar and trailing edge piece in place.

The bellcrank assembly is installed. Select a commercial type with proportions similar to the one illustrated and bolt it to a piece of hardwood which is cemented securely to the wing structure. Attach a length of 1/16″ music wire to the bellcrank to serve as control rod. Pass the lead-out lines through the holes in the ribs and attach securely to the bellcrank.

The 1/16″ sheet webs between the ribs along the spars are cemented in place. Grain should run vertically on these webs and they should be cemented to ribs as well as spars. Note that no web is required at bellcrank installation. Wing leading edge is covered with 1/16″ sheet balsa forward of front spars. We prefer a slow-drying cement for this operation. The wing center section is also treated in this manner.

Sandpaper the entire structure well and recement all joints. Cover wing with heavy paper, using cement as the adhesive. Before watering the wing cut end plates and carve and sand to a streamline shape.

Something in the way of a stunt model, you say? Something big? Here's a project to keep you busy at the bench for awhile, then provide lots of flying fun



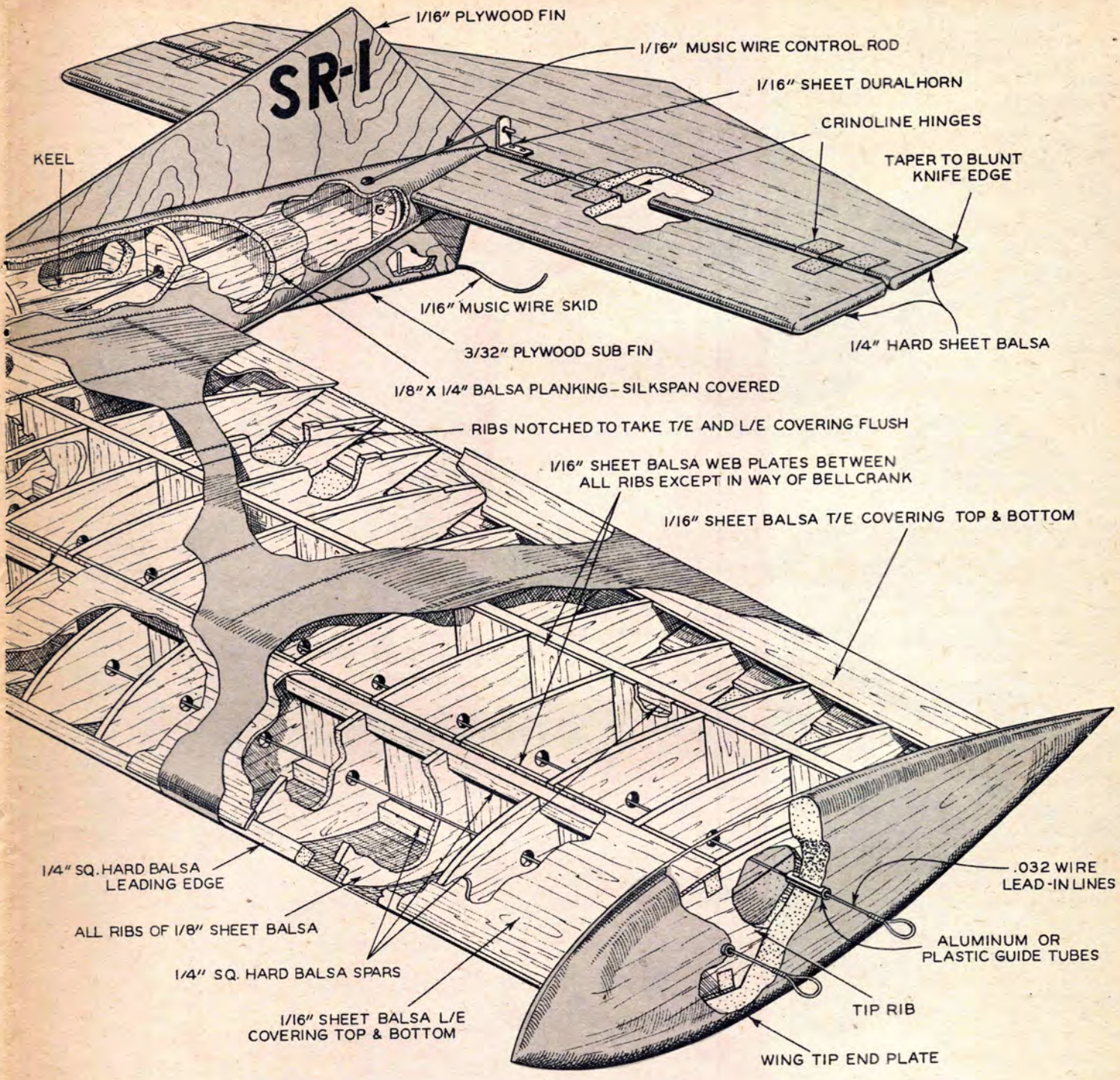
These end plates not only improve model's appearance by resembling tip tanks, but also improve wing efficiency by preventing the air from spilling over the tip which would decrease lift and increase drag. The left end plate is added at this time, the right one after the fuselage keel is slipped over the wing. Now water the wing and, when dry, apply four coats of clear dope. Give each coat plenty of time to dry.

Fuselage is built directly onto wing. Cut the ¼" sheet balsa keel, being sure to notch it for engine mounts, fuel tank, wing and stabilizer. Slip in place, cement keel to wing. While this is drying cut all formers from specified stock and cement them to keel. Cement engine mounts securely to keel; this location will vary according to the engine you intend to use. Plan the mount placement carefully before notching bulkhead "C."

We used a drop-off type of landing gear with success. If you prefer a fixed gear the performance should not suffer too greatly. Make the take-off gear first. Be sure to bind joints well with soft wire and solder liberally. Use largest wheels you have on hand (over 2½" dia.) because they are less likely to snag in grass or other undesirable surfaces.

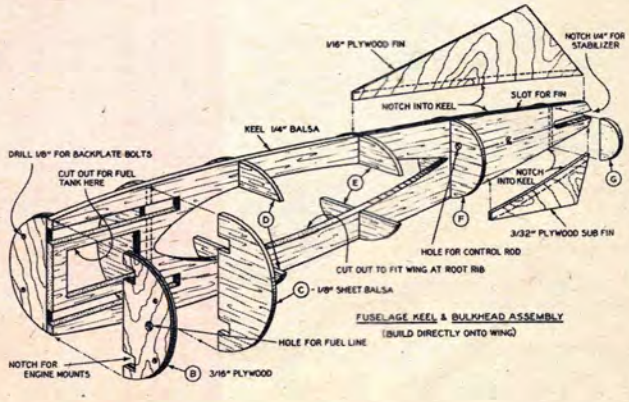
Cut a piece from a discarded tin can to the shape shown on plans. Now slip the brass tubing over take-off gear prongs and lay this on tin backplate. Solder the tubing, with prongs still inside to backplate. Use plenty of flux and solder well. When cool, the prongs can be removed and now you will be certain that they fit tubes exactly. Backplate assembly is screwed or bolted to the bulkhead "B."

Install fuel tank. Attach Neoprene or plastic tubing to the tank vents. Any commercial stunt tank will



perform well if it is correct size for the engine. Cut tail surfaces to shape and sand to streamline section. Hinge elevator to stabilizer, using crinoline strips, and fasten securely the control horn to elevator. The stabilizer is cemented to keel and the control rod connected to horn. Test the control system and apply three coats of clear dope to tail surfaces.

Planking the fuselage is much easier than some modelers would have you believe. Using a slow drying cement, attach each successive strip 180 degrees apart. In this way fuselage will not bend out of shape during construction. Sides of the planking strips must be beveled (*Continued on page* 71)



AT's monthly design contest has a fascinating subject. Are you sending in entries? See rules pg. 38 on how to enter

Flying

■ The basic problem of the Flying Wing is longitudinal stability. When the angle of attack is increased on a standard airfoil like the Clark Y, the center of lift moves forward, tending to increase the angle of attack until the wing stalls. On standard designs, the stabilizer prevents the wing from doing that.

By using a special airfoil, which has a reflex or turned-up trailing edge, the center of lift remains at the same point, or it may actually move backward and so introduce a stabilizing moment.

The stabilizing action of the reflex trailing edge airfoil can be visualized by assuming that the airfoil consists of two sections: a front portion which does the lifting, and a rear portion which takes care of the stabilizing. A check on the center of lift position of the reflex air foil will show it to be about 22% of the chord in contrast to 35% on regular airfoils. This could mean that most of the lift comes from the front portion. We might go further and cut a reflex section into two pieces so that front will be two-thirds of the total, and the rear one-third. If we leave a slight gap between the two sections, the arrangement will be similar to a very close-coupled standard wing-stabilizer layout. The reflex trailing edge will be equivalent to a negative stabilizer.

Knowing that a Flying Wing is nothing else than a close-coupled arrangement of wing and stabilizer, we do not have to use reflex airfoils to obtain longitudinal stability. We can use airfoils like Clark Y for major lifting requirements, and add the necessary stability area where it will do most good. But we won't have a true Flying Wing.

By using an extremely pronounced reflex on the trailing edge, it is possible, without using sweepback, to make a Flying Wing that will look like a plank. However, such designs are limited to gliding or to flying speeds just above the glide. Increase of speed beyond this point would introduce looping.

The lift capabilities of reflex airfoils are much lower than those of the Clark Y type. This means that, area for area, Clark Y will lift more. Therefore, there is no loss of efficiency if we do use a Clark Y in combination with a non-lifting stabilizing area.

By employing Clark Y in combination with a sweepback, it is possible to obtain a stable model by having tips set at a negative angle

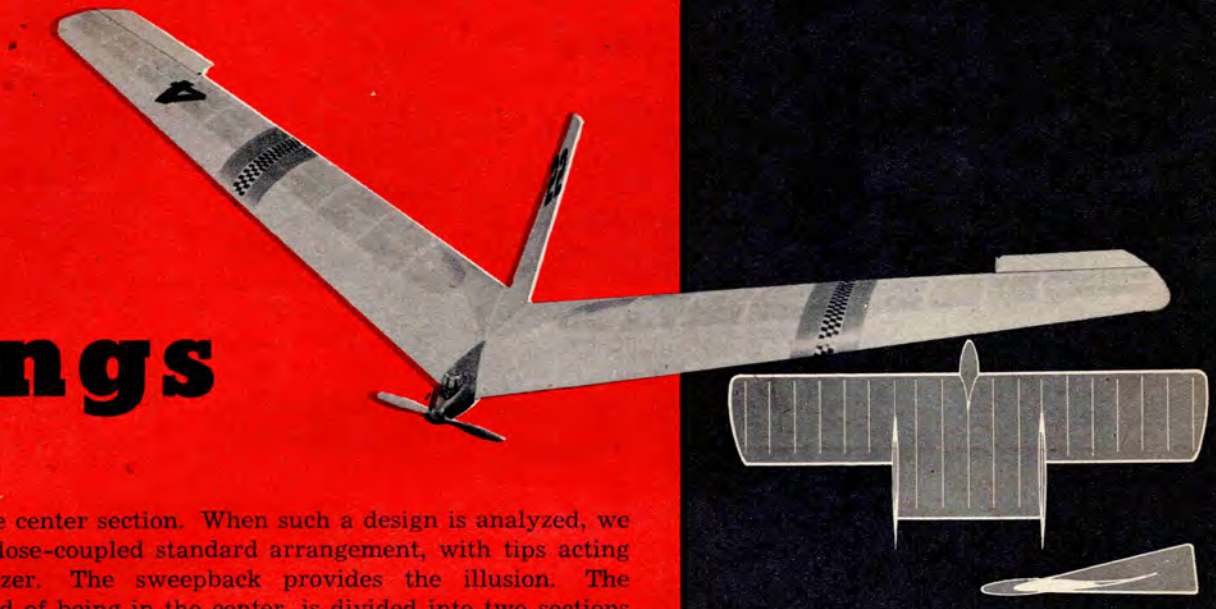
This Half-Moon shape has been tried with differing success. Quite hard to construct. A considerable portion of main lifting area is forward of midpoint. This results in tips having a relatively long moment arm which gives a desirable stabilizing action.

Swept-forward design which was tried during last war in full-scale form for towing; proved not too reliable. Model version should have sufficient negative setting at center section to provide normal stability. Use little dihedral to minimize spinning.

Although a streamlined airfoil with a center of lift travel similar to reflex type airfoils might be utilized here, you'd be safest with a reflexed section. Big problem with such a design is its extreme susceptibility to speed variations—not so very good.

Excellent experimental design. Wing setting of center portion is uniform to rudders. The adjustable tips, outside downwash airflow, are set almost at zero angle of attack. Difference between tips and main section gives the effective angle of attack.

Wings



in relation to the center section. When such a design is analyzed, we find it to be a close-coupled standard arrangement, with tips acting like the stabilizer. The sweepback provides the illusion. The stabilizer, instead of being in the center, is divided into two sections and placed on the tips.

As a rule, it is relatively easy to make Flying Wings fly as gliders. But it is another story when power is applied. Like any other short-coupled design, it has an inherent urge to loop whenever speed is increased beyond the glide range. This definitely limits the Wing to sport flying as it cannot be made to compete with standard high-speed models. If excessive power is applied, it will be converted into looping without exception. If you are determined to counteract looping with downthrust, be prepared to use as much as 20 degrees downthrust while having the engine way up above the C.G. A well balanced Wing is capable of very tight circling, and will ride the thermals with the best of them.

When a reflex trailing edge airfoil is used, the sweepback may be very small. But as the airfoil changes towards Clark Y, the sweepback angle should be increased. The only logical reason for the increase is to obtain a longer moment arm for the stabilizing tips. We can make a rough rule for sweepback angle. If a reflex airfoil has none, and Clark Y has 30 degrees, airfoils in between will have sweepback angle determined by their looks or relationship to reflex or Clark Y. This also means that if you want to use deep under-cambered type, the sweepback will have to be more than 30 degrees to provide the needed moment arm for the tips.

Dihedral angle can be very small on Flying Wings. One inch under each tip for every foot of span is more than enough. As for type of dihedral to use, a straight "V" seems best.

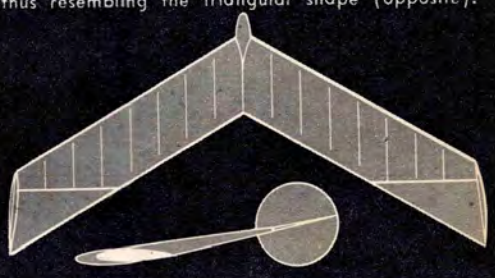
Somehow we never seem able to understand the exact function of the drooping tips. Nor the purpose of generous dihedral at center, only to have it level off at halfway mark and then droop or come up again. . . . If you think that you have dihedral troubles, increase or decrease the dihedral as a whole so that you will know just what does happen.

Rudders should be on the generous side because they have a very short moment arm. Although you may have them out at the tip, their action about the C.G. has a small moment arm. You can tell if you have too much or too little rudder area during the tow. Not enough rudder area will give you towing troubles.

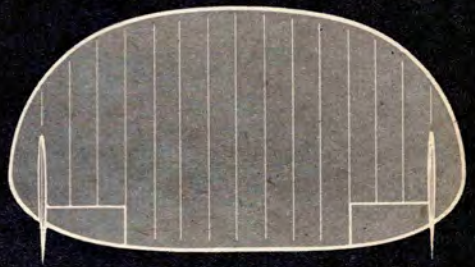
If you place the C.G. at 25% of the average chord when using Clark Y, and at 20% when using reflex airfoil, perfect stability should result no matter what type of Flying Wing you are using. It is, of course, understood that you will fulfill the rest of the requirements: such as providing the required negative angle on the tips to produce a smooth glide.

(*Continued on next page*)

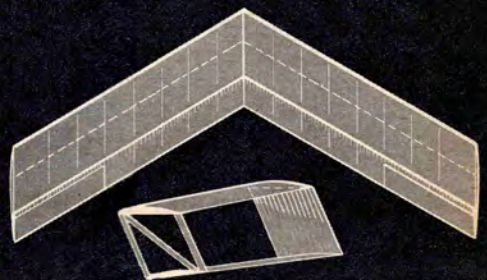
This is a close approach to a true flying wing. The tip sections have a stable M-6 airfoil, while center section has a pronounced reflex trailing edge. This type will fly well as long as speed remains uniform, thus resembling the triangular shape (opposite).



An old standby, and a popular design recommended to newcomers. Here an M-6 airfoil is featured with adjustable wing tips for establishing control. This type works out well for power flying. More of these built than all others combined.



The Flying Saucer approach. Reflex airfoils are essential here. Design extremely sensitive to power when used in free flight. Chance-Vought had full-size ship with two articulated props which took ship off at high angle of attack much like helicopter.



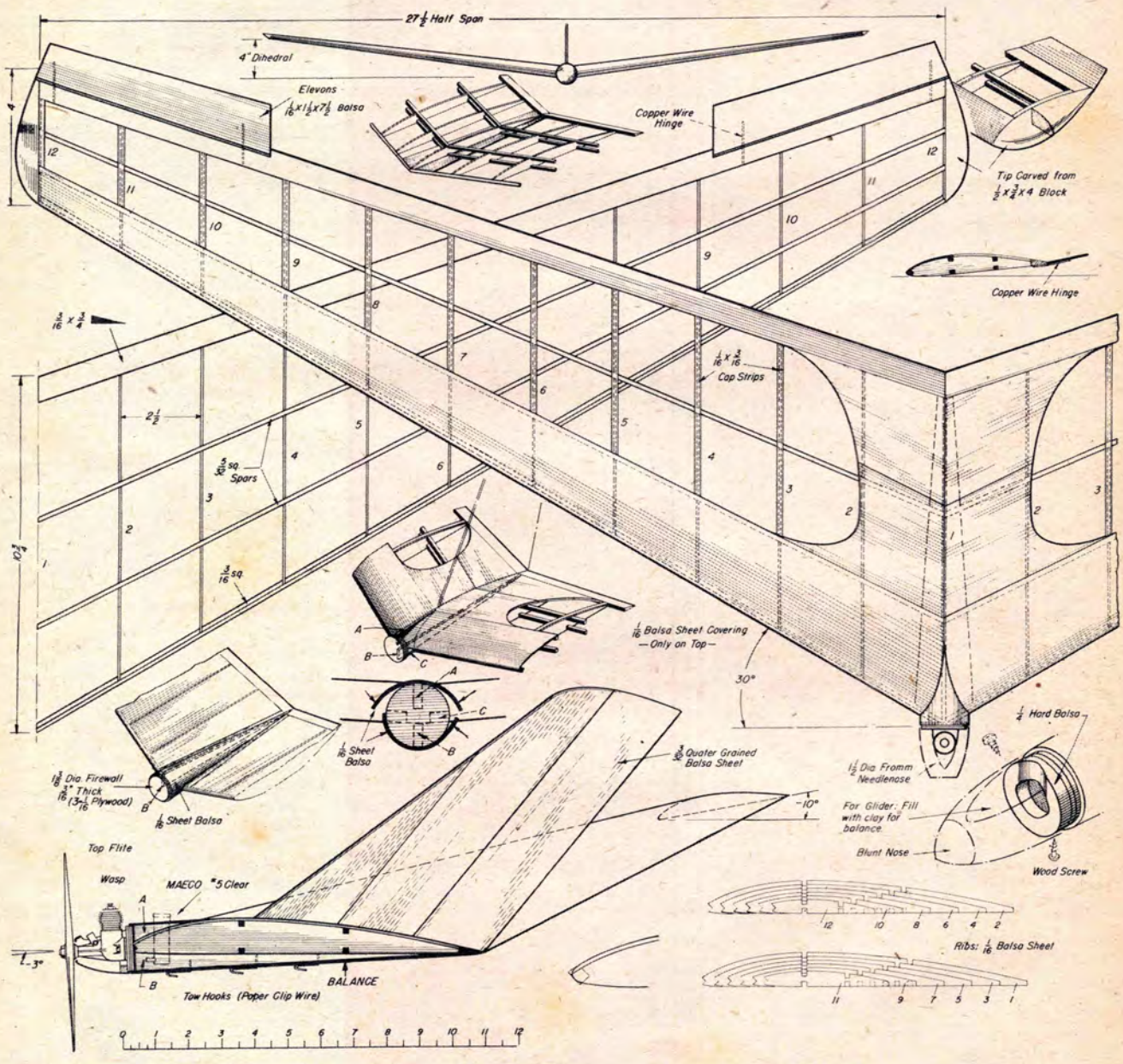
Shades of the past! This biplane combination was used many years ago. Lower wing is set at a negative angle. The tip rudders are used to separate the two wings as well as provide the required rudder area. Tricky design for use in modeling field.

By having the C.G. at the 25% point, the arrangement will have the super-stability layout. Both surfaces, the wing and the stabilizer tips, will be lifting behind the C.G. And just a slight change in the airflow will make the tips bring the Wing into the new airflow. This type of positive control can actually be observed. When such a model is disturbed it will be seen to "shimmy" back into smooth flight. In contrast, a model having the C.G. further back will develop oscillations which will end up in a dive.

It is a fact that if the C.G. is placed at the 25% point, all other items will then be automatically brought to the correct position. If you are using large tips, the negative angular change may be slight. If tips are small, the angular change will be great. You should be generous with negative tip area, otherwise you might have to use 30 degrees "up" movements which are bad drag producers.

When a wing has a gradual washout to negative tips, it is very difficult to find the average chord on which to base the 25% C.G. position. In such a case, it will be necessary to find the C.G. position by test.

Add enough balance weight to obtain a smooth glide. Now watch how the model takes upsets. If it starts to (*Continued on page 73*)



ABOUT THE DESIGNS: You are not required to build a model in this contest! All you do is submit detailed 3-view drawings of your favorite "brain-child" in each of those categories listed (plus sketches if you are artistically inclined). These drawings should not be less than 8 x 10 inches and must show dimensions. Give data on wing sections and settings, cross sections, center of gravity, weights, proposed power and the like. It's not your drafting skill that will win, but your designing ability and imagination. AT selects meritorious designs and presents them in 3-view form; payment of $5 will be made for each one published. The top design each month will be built and test-flown by AT's design and research team and the model will be given to the winner with all the equipment that goes with it. CATEGORIES: You have until July 1, 1951, to get your design studies in the mail for combination R.O.G.-R.O.W. sport free flight featuring interchangeable landing gear for any size engine—model should not be of amphibious (flying boat) type; until Aug. 1, 1951, to have entries postmarked for Half-A free flight using any size engine up to and including .050 cu. in. disp. SEND YOUR DESIGNS TO: Air-Model Design, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Decision of Air Trails staff is final; no entries will be returned.

MODEL MATTERS

Bill Dunwoddy and his scaled-up Davis *Hogan*. He calls it the *Master Hogan*. Span is 8 ft.; 1400 sq. in.; Spitfire 65.

DOPE CAN

■ An updated report on modeling in Mexico is provided by officials of the Plymouth Motor Corp. who have just returned from south of the border after extending an official invitation to Mexican modelers to participate in the 5th Internationals in Detroit. At this writing it looks as though a team from that country will take part in the big Plymouth competition under the direct sponsorship of the Mexican government.

Modeling in Mexico got under way in 1932. There were no model supply stores in the country, hence no kits. Enthusiasts used pine, since balsa wasn't available, and most built scale models. Today there are four fairly sizable hobby shops and kits are plentiful, but cost roughly double those in the U.S.

The first model motors seen in Mexico were turned out by Miguel de Rodreguez. These were made in his own workshop and had limited sale; Mr. Rodreguez built his original engine before the Brown Jr. appeared in this country. Most motors now are American made although there are a few British and Italian powerplants around. The main landing strip at the Mexico City municipal airport was the scene of early competition flying. Air traffic was so sparse that (*Continued on page* 78)

News, Views, Comments and Photos from Model Clubs and Enthusiasts in America and Overseas

Air Trails pays $5 for exclusive pictures used here; sorry, we are unable to return any.

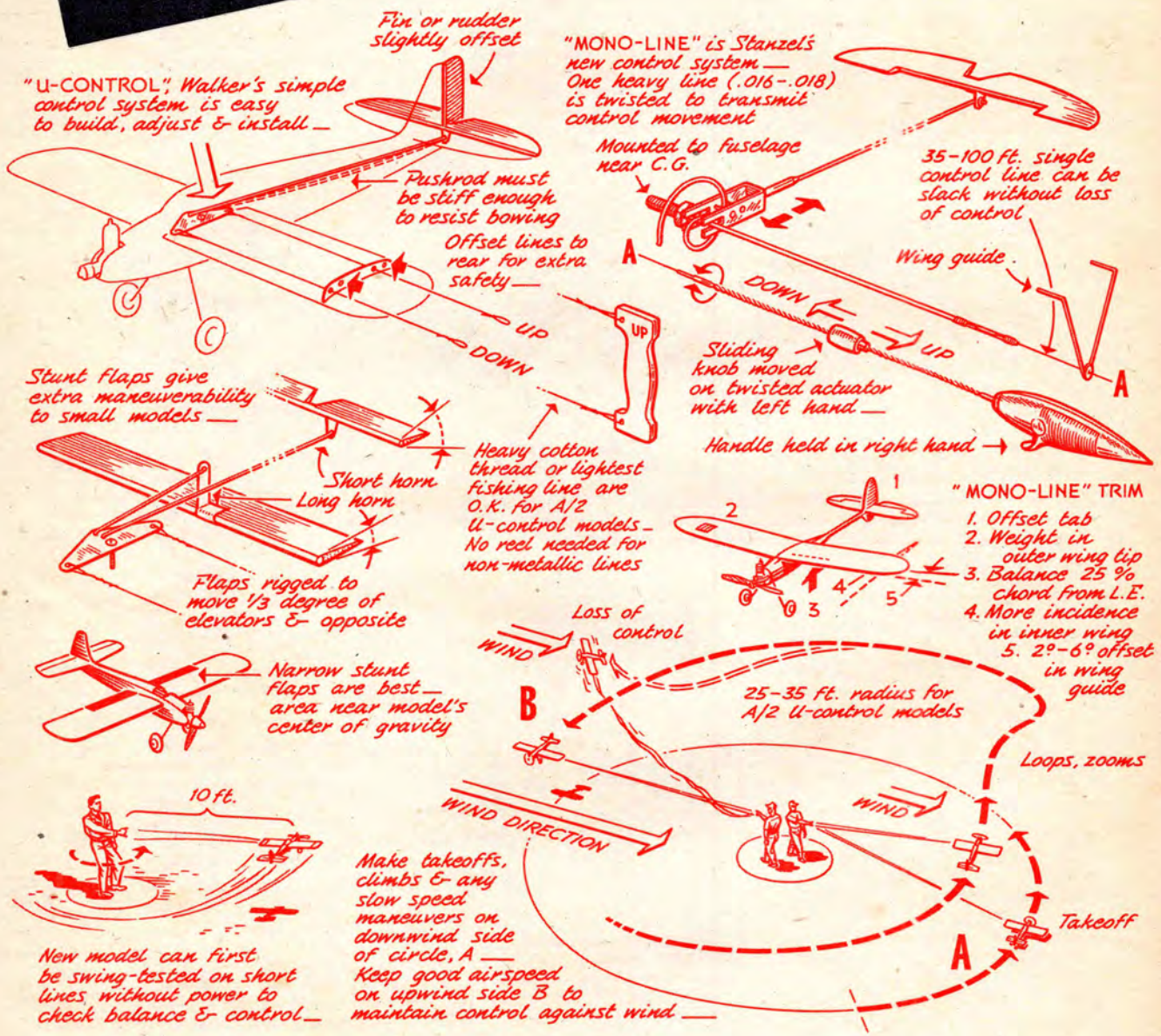
WESTERN ROUNDUP

■ The Western contest season is in full swing. This year the *Bakersfield Gas Model Association* started a new trend for free flight flying. On Saturday afternoon they held a contest for rubber models, hand-launched gliders and towline gliders. On Sunday all the regular free flight gas events plus Half-A and A-B PAA-Load. Over 200 entries were made, so you can see the scope of the contest. Half-A entries outnumbered all other classes three to one.

Some very outstanding flying was done; most of it by the younger fliers. Skippy Fattig and John Werts Jr. were just two of the many. John Andrews of Lawndale rang up an unusual high in Half-A of 19:27 for an easy win over eighty odd other entrants; second with 17:59 was Fattig. Werts stacked up 28:36 with his Arden powered *Zeek*, three minutes over his nearest rival. Robert Isaacson of Compton in his first senior year won the Hand Launch Glider event, while in rubber he outstripped fellows like Russ Johnson and Andy Peterson to haul in second place. This is quite a showing for the young fellows, particularly when one considers the type of competition they were up against.

There were some new designs that sure looked good. Elmer Achterberg's ships were very clean and showed nice workmanship. They were pretty big, the Arden 19 A job being over 5 ft. in span with a fairly long (*Continued on page* 75)

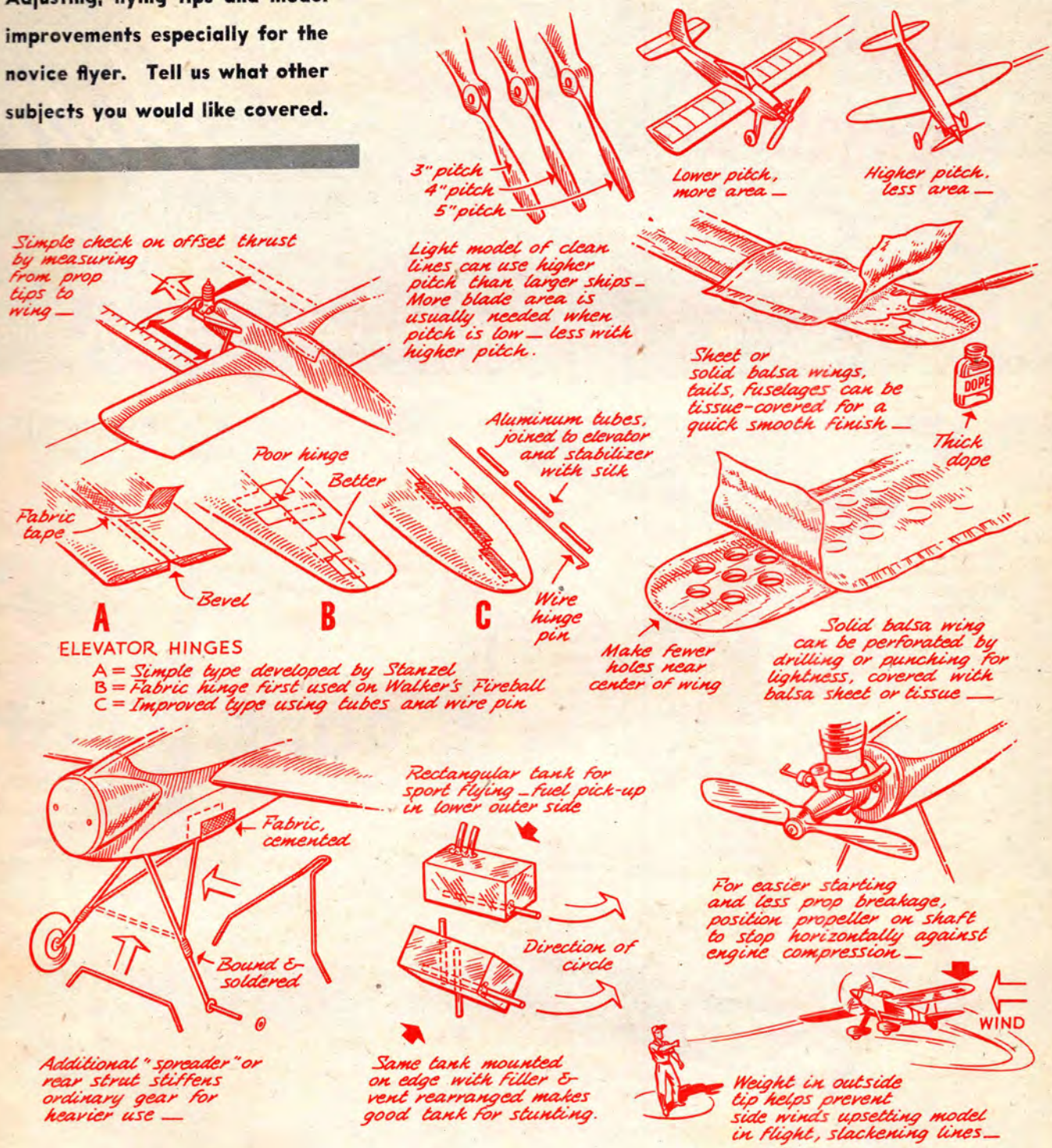
Elementary Modeling: half-A Control-line



Though the intriguing Half-A control-line models are leaders in popularity, particularly among beginners in modeling, they are not without their shortcomings. With engine displacement reduced to a small fraction of the size we have been accustomed to in the past (a Half-A engine is only *one-twelfth* the displacement of a Class D .60 engine!) there is a corresponding reduction in power. The smaller, lighter ships that result are more at the mercy of the winds than the larger ones and have little of the very "solid" feel we associate with larger, more powerful control jobs. An inexperienced modeler with a new Half-A control ship is wise to wait for calm weather. Follow the wind diagram carefully for proper operation.

Jim Walker's "U-Control" and the new Stanzel "Mono-Line" are the control systems in use nowadays. U-Control, with its inherent simplicity, is foolproof; it utilizes two tether lines to handle, movements of which are transmitted to a pivoted bellcrank, thence to hinged elevator. The lines must be kept taut, however, and such methods as outward offset engine thrust line, outward offset rudder tab, weight in outer wing tip, more incidence in inner wing panel, and rearward location of control line wing guides are resorted to in various combinations to maintain line tension. These many "tools"

Adjusting, flying tips and model improvements especially for the novice flyer. Tell us what other subjects you would like covered.



can be used to extreme, causing a crabbing flight attitude which is neither efficient nor desirable. An untested model should incorporate perhaps two of these wrinkles for a safe test flight; reduce them as much as the flight attitude indicates you can get by with.

Half-A models can be flown on very lightest casting line or heavy commercial cotton thread. Only the lightest wire lines need be used. Heavy threads can be wrapped around the handle, while metal lines require use of a reel to prevent kinking or curling.

Mono-Line flying presents two outstanding advantages: longer lines can be used—up to 100 ft. radius—and full control is maintained even if the line should become slack. When short lines are used, .016" dia. steel wire is specified, and when length is increased to 100 ft., the diameter is increased to .018". Smaller or larger sizes of wire affect control; don't use stranded or braided "cables."

It is best to balance U-Control models fairly nose-heavy, somewhere near the wing leading edge. Mono-Line ships should balance about 25% of chord from leading edge. Selection of woods, type and extent of paint job, wheels, propellers, etc. affect balance greatly. Improper balance of a finished model can often be corrected with lead weights.

FOR MODELERS WHO WAN

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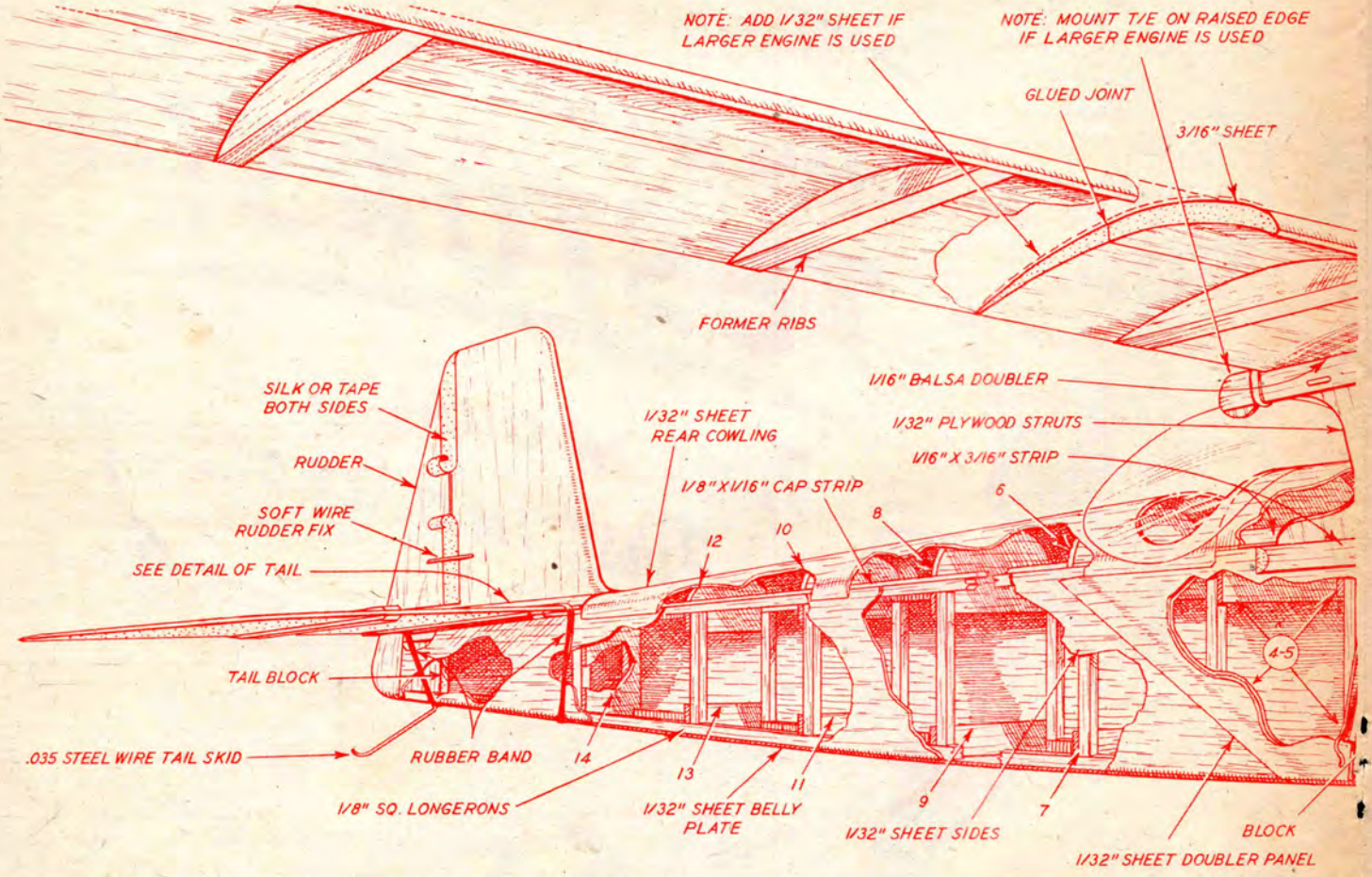
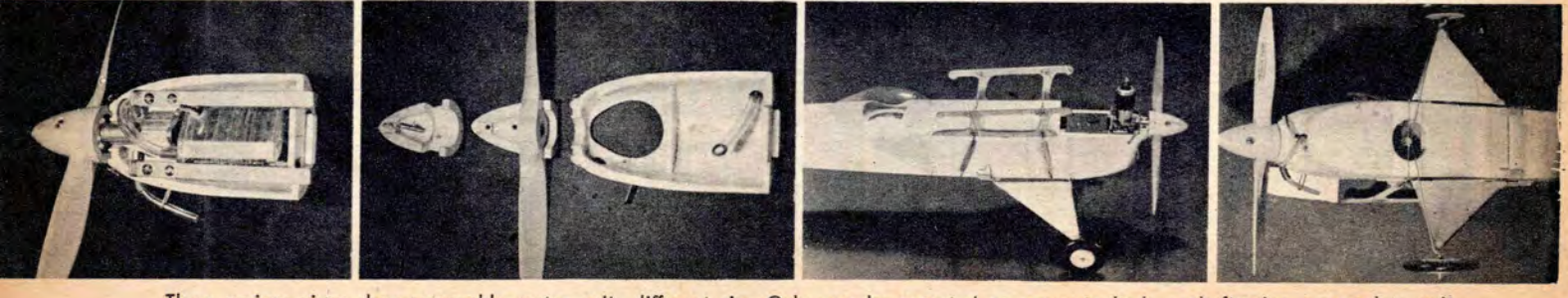
Double Duty SKYLARK





These various views show removable motor unit; different size Cubs can be mounted on separate beds each forming a complete unit.

■ Free flight model planes provide more flying pleasure when they can be flown in restricted areas without going out of sight. Many model flyers have endeavored to solve this problem with various gadgets, of which dethermalizers have been most common. Others either have not attempted free flight or have given it up in favor of control line planes.

With this little plane modelers now can enjoy restricted free flight performance combined with the thrill of control line flying. It is designed as a free flight plane, with optional means of flying it on a tether line, or if preferred, with control lines.

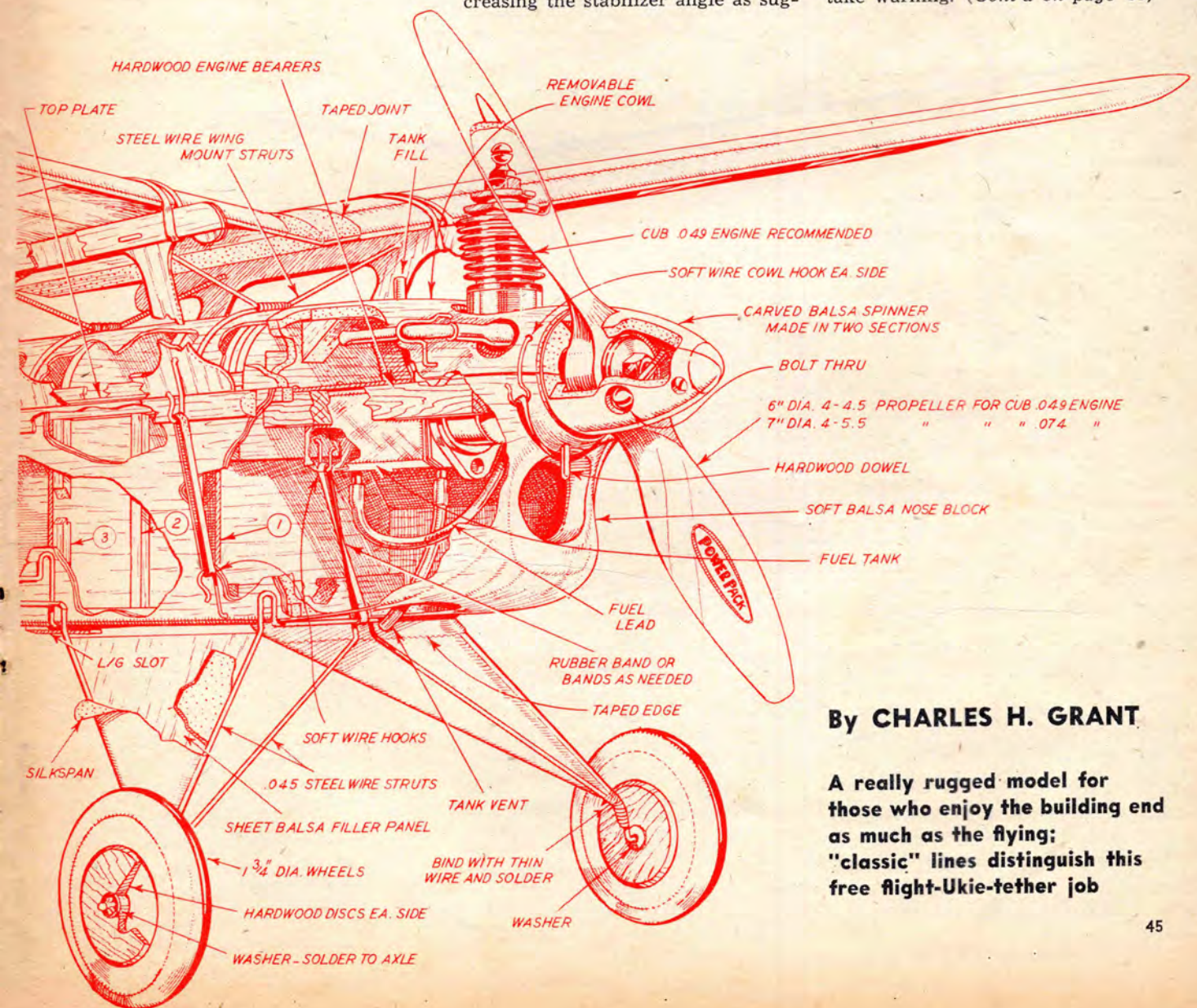
Its small size of only thirty-two-inch wingspan, its simplicity and careful structural design provide great strength that resists damage. Test flights, in fact, have shown that it will take a terrific beating without breaking anything but a propeller. It is designed to fly with the Cub .074 or the smaller Cub .049. Either motor may be used for free flight, but the smaller Cub .049 is recommended for tether line flying, at least until the proper flight adjustments have been made.

When the model is adjusted so flights are comparatively level without excessive climb, the larger engine may be installed. However, then the wing incidence angle must be reduced by raising the wing trailing edge to the highest level on the wing mount stringers and the leading edge of the stabilizer should be raised one-sixth inch to give a positive angle of incidence of one degree.

The plane flew well from the first test flight, but showed a tendency to excessive climb. This was corrected by using the smaller engine, reducing the wing angle and increasing the stabilizer angle as suggested above. The resemblance of the plane in flight to a full-scale ship gave observers a real thrill.

After numerous tethered and control line flights, free flights were attempted. At first excessive wing incidence combined with a stiff breeze threw the little plane into a series of loops when the heavy engine was used, but its speed and climb gave indications of a real contest winner. Finally with corrected wing adjustment the plane was launched three-quarters into the wind. It started to climb in wide spirals, but the mechanic's hand must have slipped when fueling up the tank because it was soon apparent that an overdose of fuel had been applied. The engine kept right on going, and so did the plane up to several hundred feet altitude and out of sight over a wooded ridge nearly a mile away. Quite a beginning!

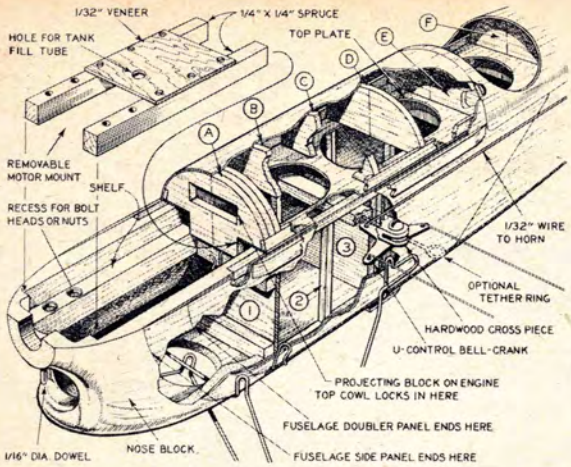
Those who build this little ship, take warning. (*Cont'd on page* 65)

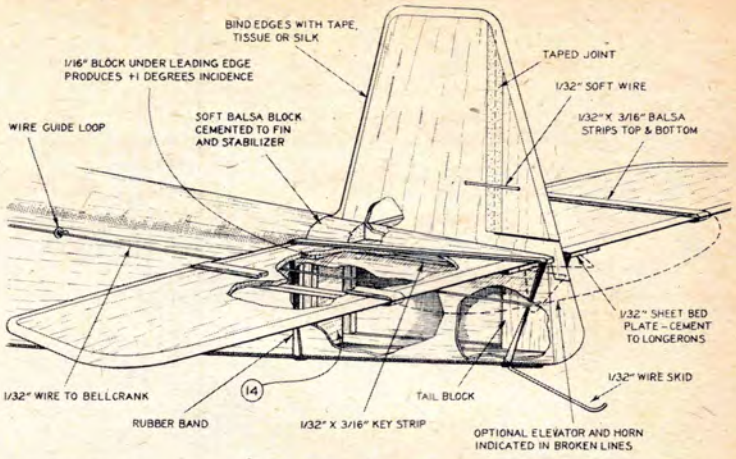


By CHARLES H. GRANT

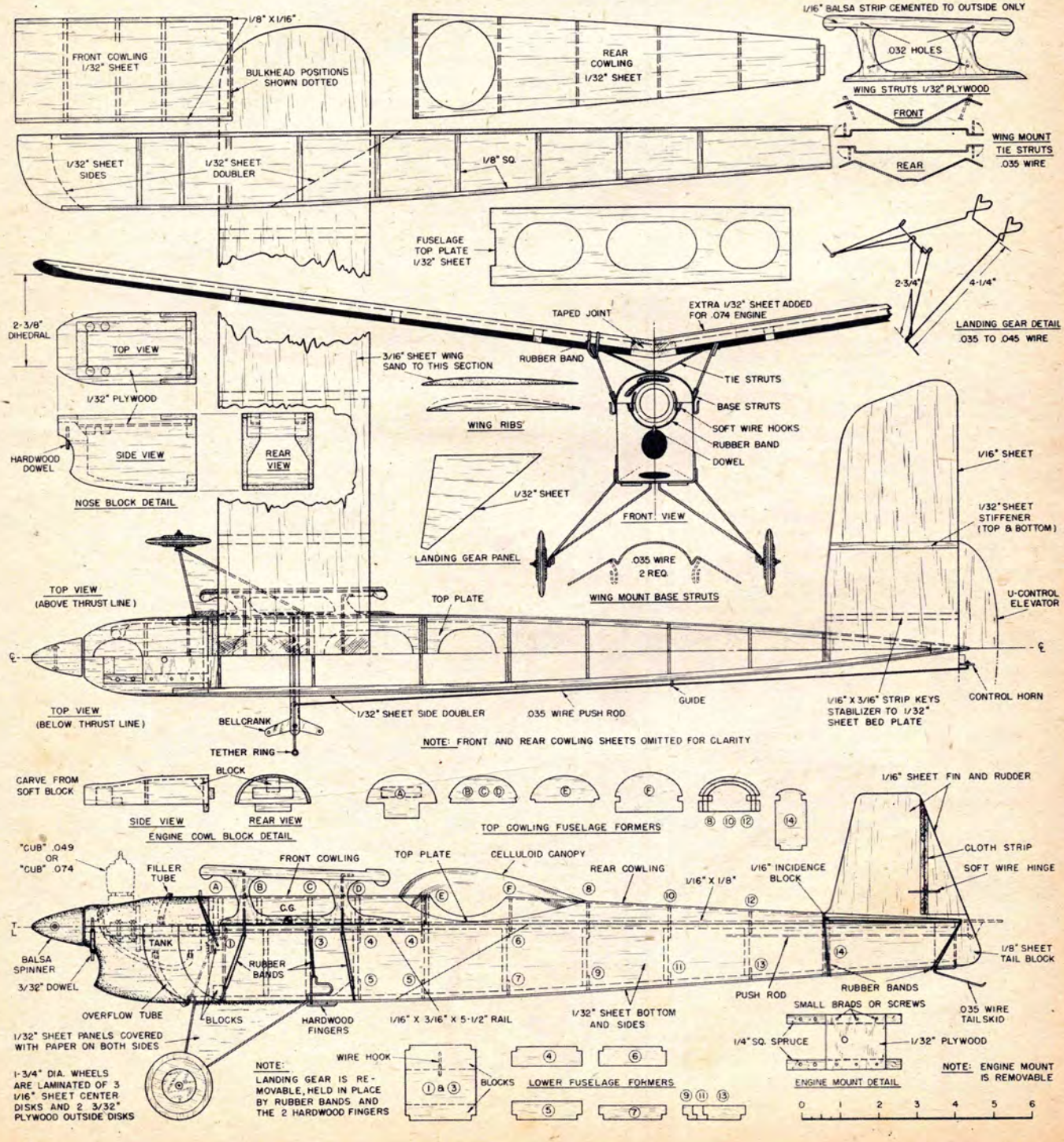
A really rugged model for those who enjoy the building end as much as the flying; "classic" lines distinguish this free flight-Ukie-tether job

DOUBLE DUTY SKYLARK





Good construction practices are followed throughout model which is somewhat heavier and more rugged than the average contest flyer.



BATTLE REPORT

Walker to send U.S. Wakefield team to Finland....genial Jim Walker, inventor of U-control and outstanding model experimenter, has offered $5,000 to American Wakefield Committee to cover transportation costs of 6-man team to Helsinki.

Air Force Model Airplane Meet to select a service team to compete in the Nationals is definitely scheduled for July 16-21 according to Lt. Harry G. Vogler, Jr., AF Project Officer; site will be Sheppard AFB, Texas....National meet events are same as last year except outdoor stick and cabin rubber, now designated as "unlimited" and Wakefield, and CO_2 event is eliminated; PAA-Load change to Half-A, combined AB and Clipper Cargo. Ernie Shailor of Detroit, Mich., won Air Trails' name contest for the two PAA-Load events. The Half-A 3-oz. dummy he named "Junior" and the 8-oz. dummy passenger (one for Cl. A, two for Cl. B) he dubbed "Pappy"....so it's now officially "JUNIOR PAA-LOAD" and "PAPPY PAA-LOAD." Jim Walker's first Solo Flight Tournament at San Diego, Calif., was a great success. Dennis Alford, 8, won; Robert Ehrhart was second. Both were to receive trips to Portland, Ore. Dennis soloed 33 newcomers to modeling; Robert checked out 22 new flyers over 5-week period. In one 2-hour session during contest 22 brand-new enthusiasts flew a U-control model by themselves for the first time; a tremendous increase in activity was reported throughout the entire San Diego area as a result of the tournament.

Plymouth Motor Corp's 5th International Model Plane contest will be in Detroit August 22-27. Official entry forms at Plymouth dealers' showrooms. Two spectacular new events, combat flying and Navy carrier deck operations, are among the 31 events; both have been flown previously as exhibitions, this year they are on a competitive basis. Competition is stiff at Detroit; 15 national and 21 international records were bettered last summer. Invitations to the meet are limited to 500 top modelers. First preference goes to flyers who qualify in contests sponsored or co-sponsored by Plymouth dealers. Second preference will be given to those flyers who submit applications based on winning performances in other A.M.A. sanctioned contests. Prizes will include $4,725 in U.S. Savings Bonds as well as 96 trophies.

Plymouth dealers throughout the country are offering all expense Detroit trips as prizes for winners in local and state contests who receive invitations to the International. During the six days of flying at the International, the contestants will be housed in a downtown hotel and will be provided with a complete program of entertainment during their free hours.

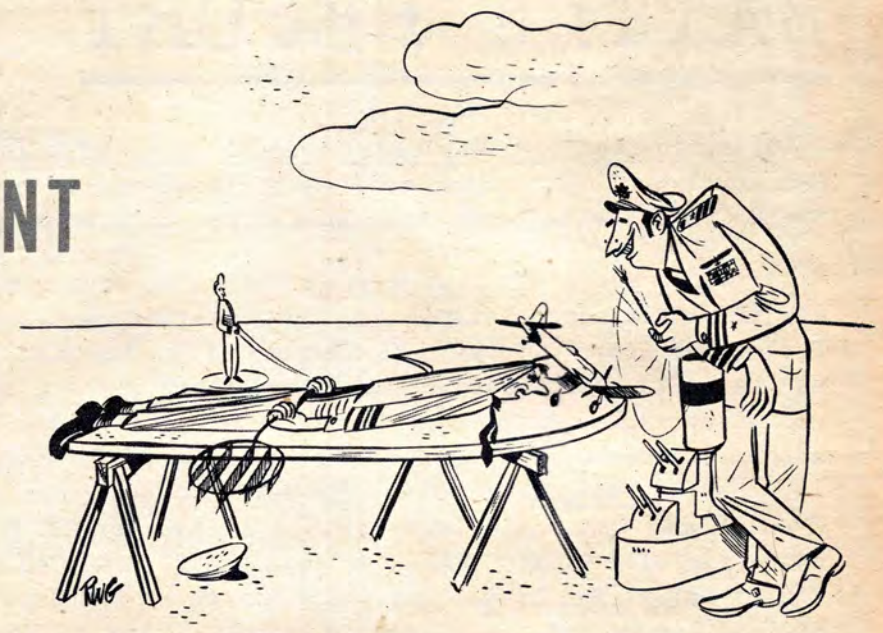
Competition will be open to all boys and girls from youngest model builders up to and including those who have reached their twentieth birthday. Model flyers above the age of twenty may still fly in a special open class in the state and local contests, but will not be permitted to compete with the younger modelers in Detroit.

Combat event will feature actual "dogfights" by the planes of two contestants who compete against each other. The U-control stunt-type models have long paper streamers attached, and the idea is to cut the opponent's streamer as near as possible to the plane. Judges award points for successful attacks and evasion. Team racing, added to the International for the first time last (Continued on page 78)

FLYING THE CARRIER EVENT

Here's what every contestant should know about selecting a model and engine for the Navy's event as told by the 1950 winner

By S. CALHOUN SMITH



"It's the model that hits the deck, Perkins . . ."

■ Most of the scale details that can be added to the *Skyraider* model presented last month are on the underside of the wings. Here is the firepower department, and although accurate details are unobtainable we've done the best we can with the many photos on hand.

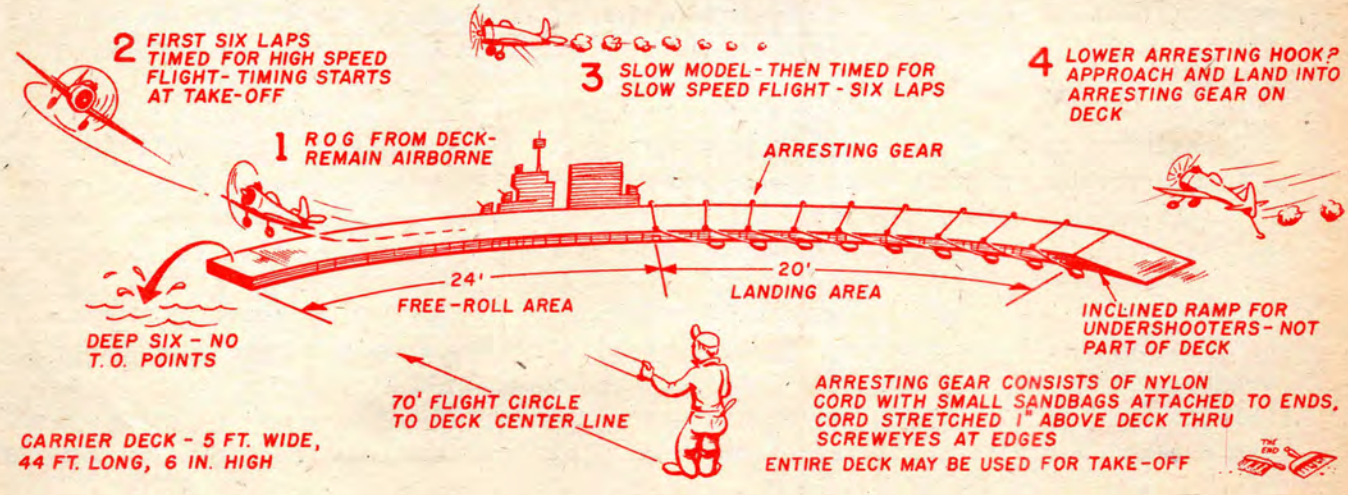
There are numerous combinations of "bad news" that can be carried, such as: twelve 5" or 6.5" rockets or light bombs and three 150 gal. drop tanks for very long range operation. With a single 150 gal. drop tank the AD can carry two 11.75" Tiny Tim rockets or two 2000 lb. bombs. For short range missions the load can be three 2000 lb. bombs. Also three 1000 lb. bombs or two Tiny Tims and one 21" 2000 lb. torpedo, or two Tiny Tims and one 1000 lb. bomb and twelve 5" rockets. Throw in some Napalm and anti-personnel frag bombs—anything up to 6000 lbs. and—why, it's enough to scare the wits out of you.

Shown on the plans are details of the bomb and rocket racks and outlines for the Tiny Tim, 5" and 6.5" shaped charge rockets. These can be made of birch dowel if you want to carry the extra weight, or can be carved from balsa. The rockets will make an impressive display in any flying scale or beauty event.

Fleet marking letter and numeral combinations are also shown on the plan, and to further confuse the enemy we are not giving the right names. Letters and numerals are all white. Some squadrons have bright color bands around cowl front and across fin and rudder top. These can be added to further dress up your model. Pilot and squadron insignias are also carried on fuselage sides, below cockpit. Trim-Film decal sheets can be used for all these markings.

Thanks to the effort of Lt. John H. Burton, the first Navy Carrier Event was held at the 1950 Nationals. The rules governing the competition were briefly as follows:

Any type model is eligible, scale models of existing naval aircraft may be to any scale, the only restriction being maximum size, 44" span, 58" length and 17" height. Models must have a conventional



(fixed or retractable) landing gear and any engine may be used.

The model must R.O.G. from the simulated carrier deck and stay airborne. One hundred points given for successful take-off. The first six laps after take-off will be timed for high-speed flight. One point for each mph average speed.

When model is slowed down the next six laps are timed for slow-speed flight. The difference between high and low speeds is added to the high speed points to get total speed points possible.

An arresting hook shall be provided on the model for landing into the gear on the carrier deck. One hundred points will be awarded for a successful arrested landing with the model on the deck and in any position except over on its back.

Bonus points (100) will be awarded for true scale replica of any U. S. military aircraft.

Total points will be sum of take-off, high speed, low speed, landing and bonus points gained in one flight.

Five minutes allowed for preparation and three attempts permitted.

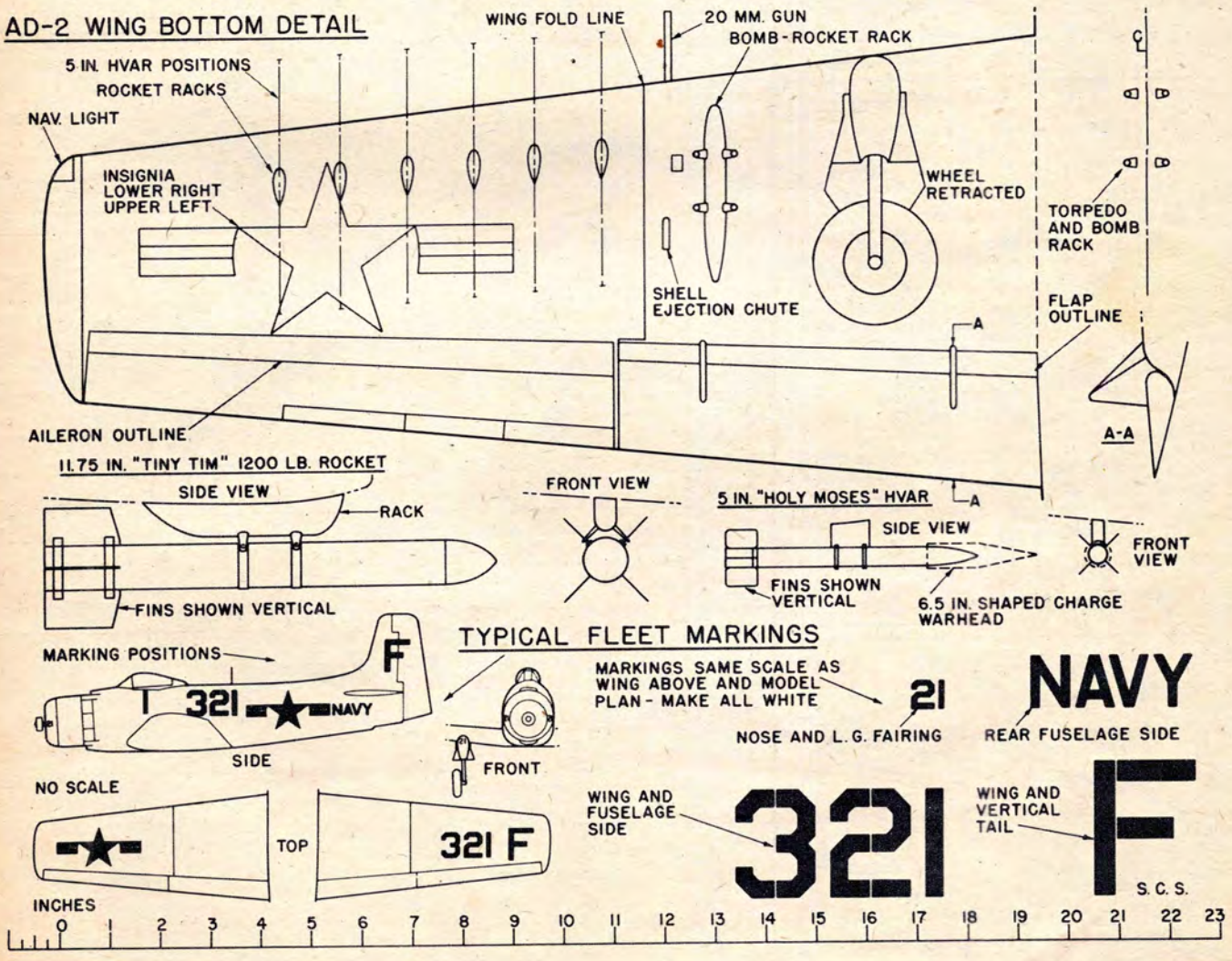
Sounds tough to beat, doesn't it?

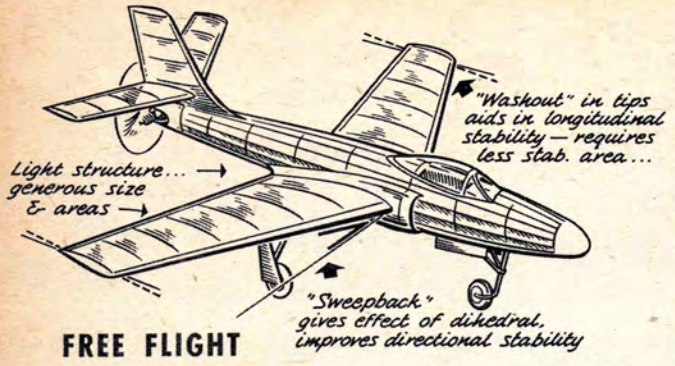
In designing for the 1950 event the first item needed was 2-speed control. We fell back on the tried and true ignition O&R 60 with 2-speed points running on gas and oil fuel. This eased starting and flight problems when used with Jim Walker's Remoto control handle. It was felt that the emphasis should be on the slow speed rather than the high so that a decent landing could be made without scattering arresting gear and tail feathers all over the deck. As a result, top speed was only 56 mph, and low speed 43 mph. Recent developments such as Deco's glow plug 2-speed throttle will spread out the difference between high and low speeds for the coming 1951 contest.

Some modelers have experimented with the variable-pitch propeller. Here is one gadget that would really aid high and low speed flight performance. The problems are pretty complicated but not insurmountable.

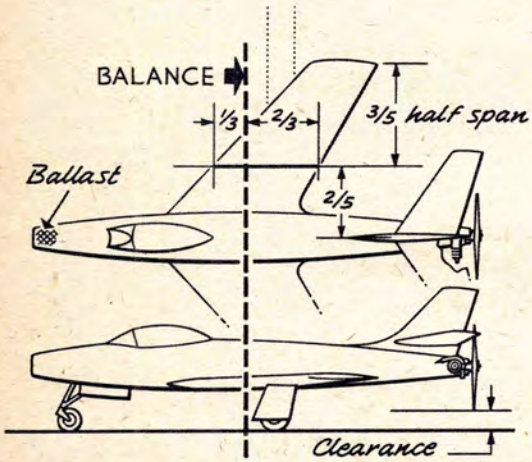
Various schemes were tried at the 1950 contest for slowing down the models. Third-line-operated chokes on glow plug engines, trailing parachutes and wing flaps released by timers, turned up. None of the systems proved completely successful, indicating there is room for development in this department.

We built operating wing flaps into the *Skyraider*, but test flights did not prove very successful. There was too much trim change with flaps down to be fully controlled by the elevators. The flaps were spring loaded into the down position, and the model developed beautiful roll tendencies (*Continued on page* 63)

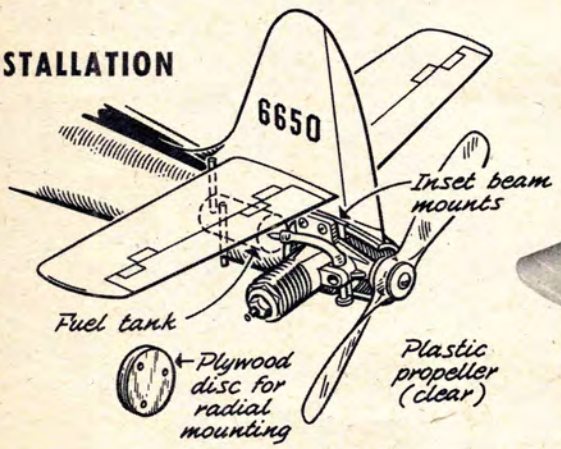




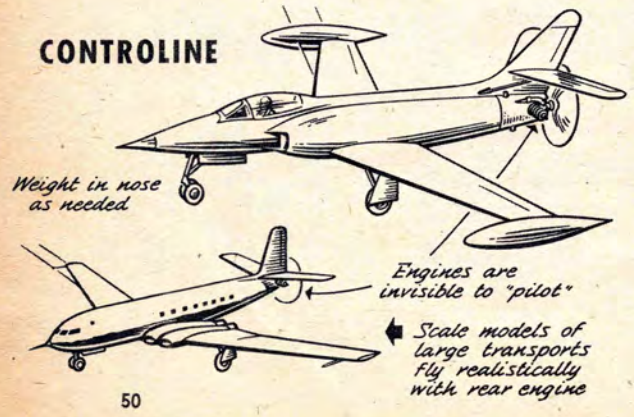
FREE FLIGHT



INSTALLATION



CONTROLINE



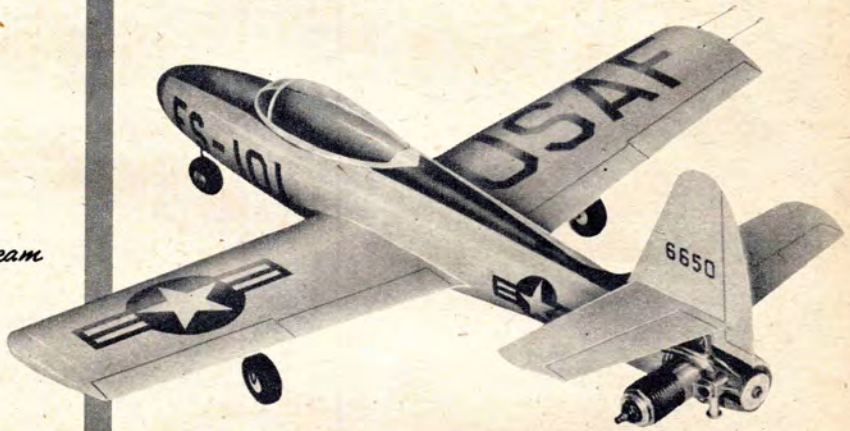
PROP POWER FOR MODEL JETS

By J. LOWRIE McLARTY

■ Would you like to have a sleek new jet fighter to enter in U-control contests? Or to fly as a free flight? With a few odd arrangements and some design tricks, the thrill of jet flying can be yours.

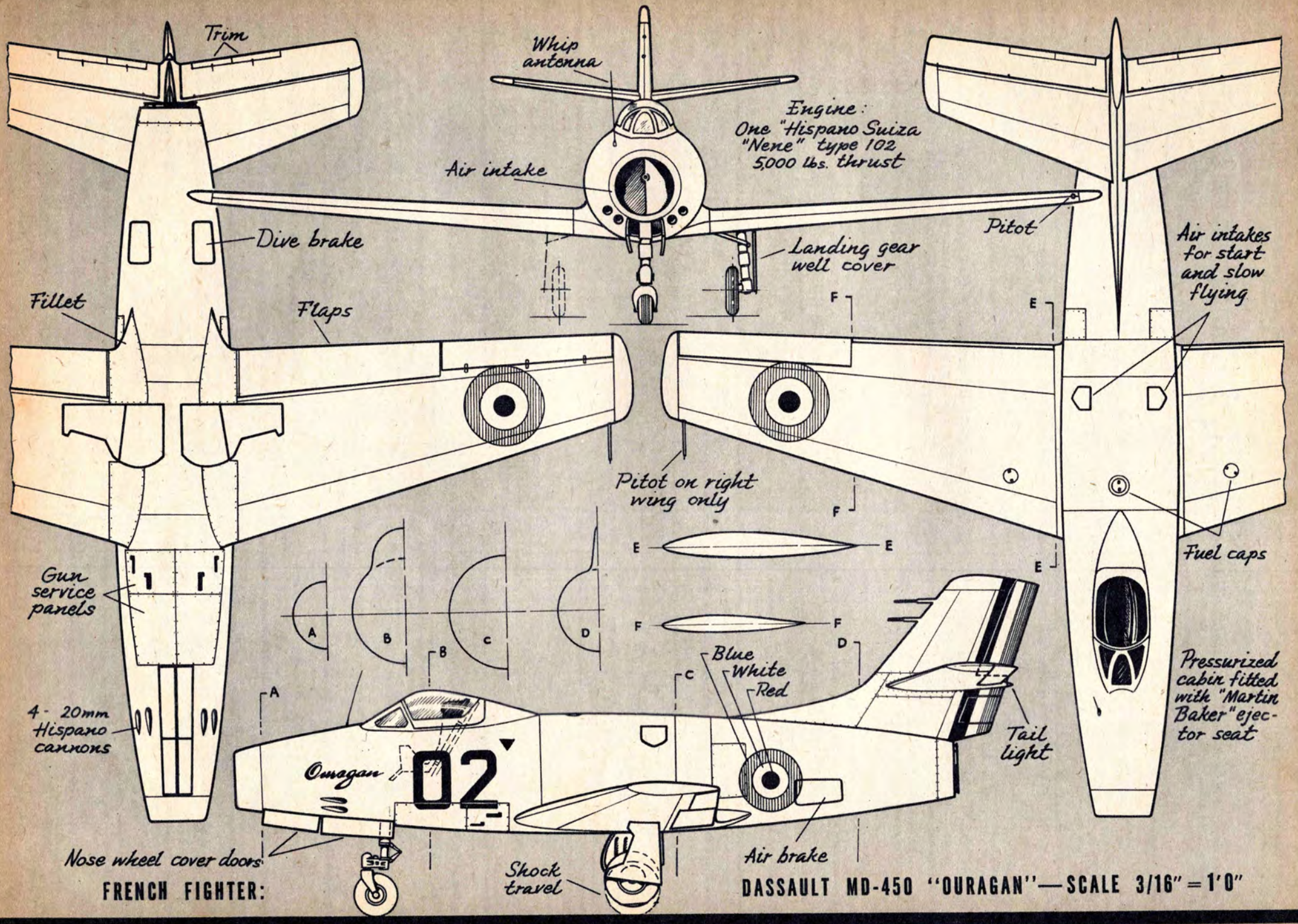
With the advent of jet-powered aircraft the model-plane is likely to become more "old-fashioned" in design than ever before. But before we give up and go back to wire-braced biplanes, let's consider the idea of putting our engine in the rear, hiding it in the jet exhaust under the tailplane. The rearward wing position is an advantage since it allows us to balance the engine's weight in the rear with a small weight in the extreme end of the nose. The tricycle gear of course permits us to use a propeller without cutting the grass.

Scale jets for beauty and U-control flying can easily



have a Half-A engine mounted so as to be quickly removed, with cover plates added to hide all evidences of their source of power. In case your engine will not run clockwise (most will run in either direction) or if you cannot find a pusher propeller, or carve one, dip a plastic propeller into boiling water until it softens enough to twist. Match its shape against another until they are identical, then place in cold water. We have done this with complete success.

The best results in free flight scale jet have been with models of low wing loading. Since Half-A engines deliver such comparatively great power for their weight and size, they are the logical thing to use. An .049 displacement engine, for example, would power a 3- to 4-foot (300-500 square inches) span model weighing 10 to 15 ounces, and give it jet-like performance. The construction should be simple and light; 1/32" balsa sheet fuselage, or ⅛" stringers and tissue covering with built-up wings and tail surfaces would be suitable.



FRENCH FIGHTER:

DASSAULT MD-450 "OURAGAN"—SCALE 3/16" = 1'0"

Model of the Month—Monarch's P-40

A plane sure to prove popular with a lot of ex-GI's as well as flying scale model fans is this well-remembered pursuit

■ While we have covered a variety of models in this department over the last few months, it has been some time since our subject was a scale gassie. Let's look over one of the newest scale control line kits, put out by Monarch Model Aircraft Co., Inc., Brooklyn, New York, and featuring the attractive *Curtiss P-40F,* with a finished wingspan of 20″.

Through the introduction of such kits as their Half-A free flight gassie—*Scot-Free*—Monarch has gained quite a reputation in the prefab kit field. Especially notable are their shaped blocks of solid balsa which are so neatly cut that they have a sculptured look. Since the entire fuselage and main wings of the new *P-40F* are fashioned from solid balsa, Monarch has a good chance to exhibit its specialty; these pieces on the sample kit were exceptionally well done.

The fuselage of the new model consists of three layers, and is adaptable to all makes of engines, both beam and radial style. The *P-40F* is capable of carrying engines from .049 to .099. The latter is a tailor-made fit, but for those who want their flying to be fast and furious, the bigger engine is the logical choice.

Due to the shape of the P-40 nose, the model engine must be used inverted, so be sure to choose a powerplant that is happy in this position. Ample space is provided in the hollowed-out fuselage for almost any sort of tank you wish. The upper nose cowling is designed to be removable for filling the tank and for engine service. Most engines will be completely enclosed except for the tip of the glow plug protruding from the lower cowl.

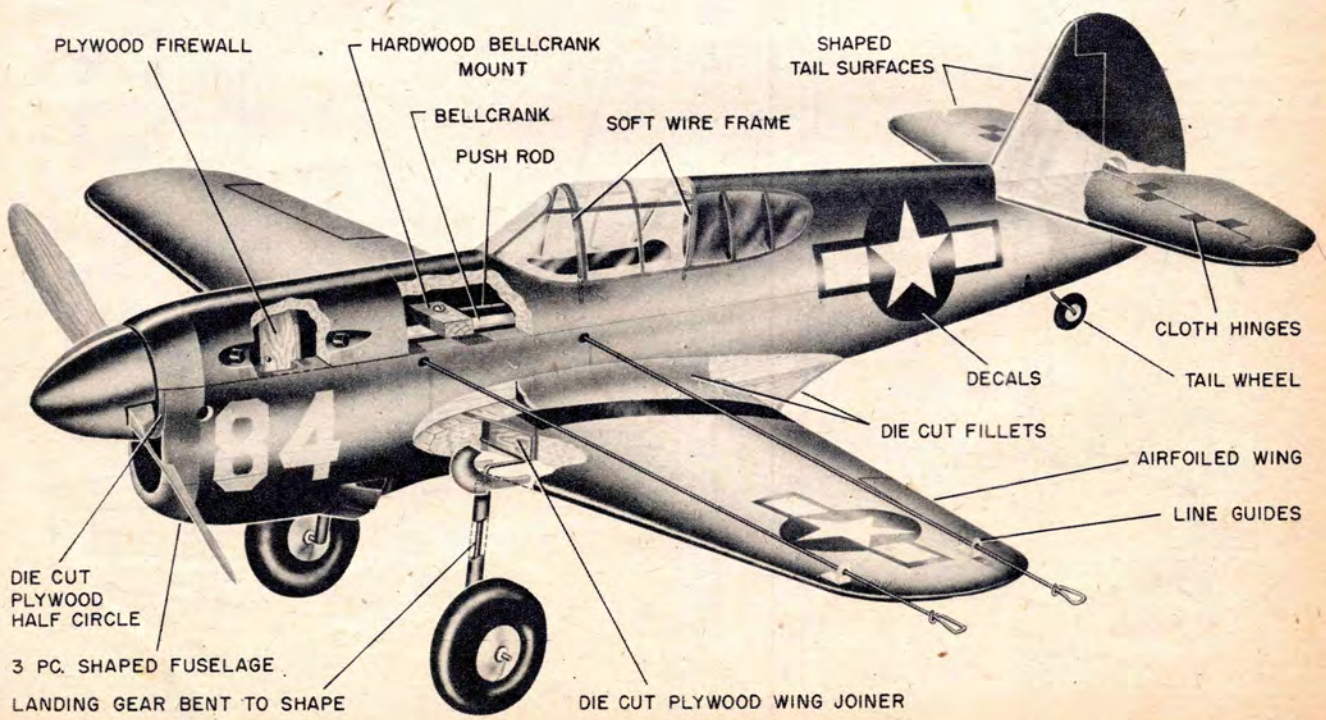
Though the cylinder head is closed in, provision is made for ample flow of cooling air which enters beneath the spinner and exits on the underside of the fuselage. The exhaust fumes from the engine come out the same opening.

The exhaust baffle and the firewall-engine mount are plywood; plywood is also used to strengthen the fuselage nose and for the wing panel joiner. These wing panels are well shaped. As is the case with practically the entire kit, the wings require no knife work; sandpaper completes the finishing job.

The landing gear wire is formed. Though the wire is quite heavy, appearance can be enhanced if some material such as radio spaghetti tubing is slipped over the vertical portion to enlarge it to the approximate size of the prototype struts. Rubber wheels are furnished with the kit which also includes a tail wheel.

Rudder, elevator and stabilizer are die-cut from ¼″ balsa, and the latter two are fastened together with the cloth hinges.

Old-timers will recall that the P-40 series had rather large fillets between (*Continued on page* 58)



FUN OR TROPHIES

YOU GET BOTH
with the new
K&B TORPEDO .19

COMPLETE WITH PROPELLER
$12.95

The new K & B Torpedo .19 is the answer to *popular demand* from modelers all over the country.

Here's the engine with the "advance design" features. Tests prove the new K & B Torpedo .19 will be one of the big trophy winners of the years ahead.

The new K & B .19 is on display at your dealers now.

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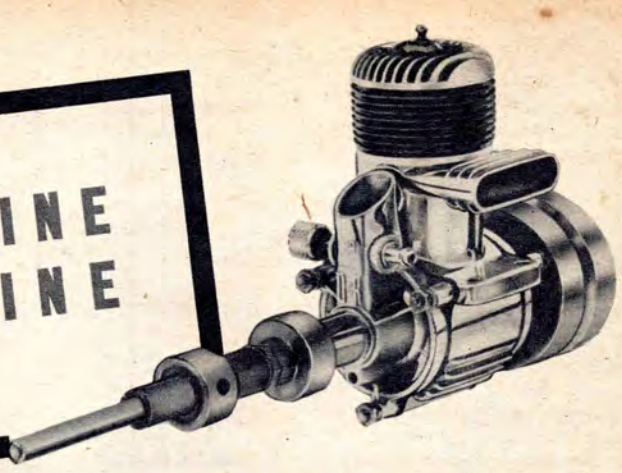
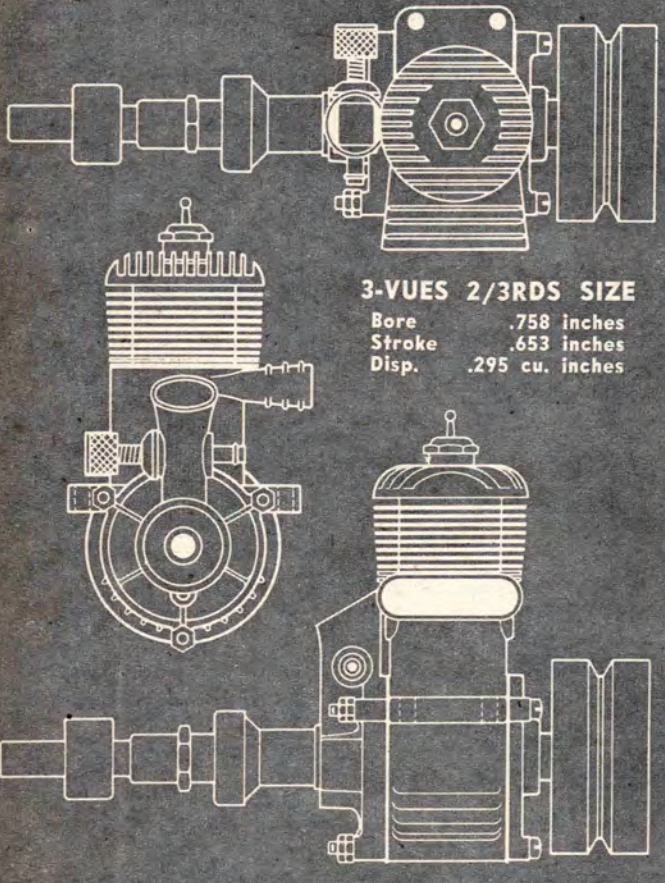
O&R'S MARINE ENGINE

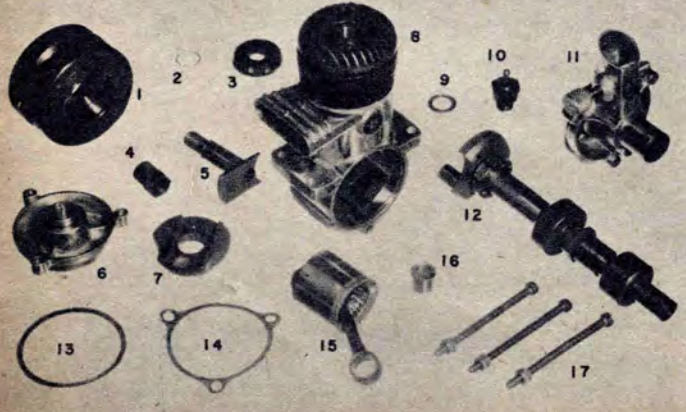


Ever been bitten by the boat bug? If so, you'll be able to appreciate this "packaged" Ohlsson powerplant



3-VUES 2/3RDS SIZE

Bore	.758 inches
Stroke	.653 inches
Disp.	.295 cu. inches



■ Ohlsson & Rice have made an all-out effort to supply every part required for the gas model boat builder. The only work remaining to be done after purchasing the marine engine and the accessory kit is to cut the propeller shaft to the right length and drill two holes.

Among many new features, the rear flywheel is the most outstanding. This arrangement makes it possible to mount the engine much lower in the boat without the flywheel touching the bottom. Starting is also simplified since it is very easy to wrap the starting cord around the flywheel. With the conventional front flywheel design the cord must be threaded under the propeller shaft for each turn, and hence starting is much slower.

On the Ohlsson 29 engine the flywheel is mounted on a separate rear shaft which is driven by an extension of the crankpin. This complete assembly fits into a rear cover plate. The front cover plate is similar to the regular O&R 29 airplane engine, except it has a larger needle valve.

A complete new piston assembly is used in this engine for the first time. It consists of a hardened and ground steel sleeve with aluminum inserts. The hard sleeve contacts the cylinder wall and forms a good bearing surface.

A cast aluminum head and another lower assembly are fitted to the sleeve and welded in by a special process in a die-casting machine. The wristpin is completely encircled by the sleeve and has larger bearing areas than the old style Ohlsson piston. The engine is sold complete with a ball thrust bearing unit and a universal joint available to fit six different shaft sizes.

All remaining parts except the propeller can be purchased in an Ohlsson & Rice Marine Accessory Kit. This kit contains the propeller shaft, a strut or rear bearing, a stuff box with attaching plate, a rubber seal, shear pins and all the necessary bolts and screws. These kits are available for ⅛", 5/32", or 3/16" shafts. A variety of propellers are available from ⅞" to 2" in diameter in the two-blade type. Three-blade propellers may also be had. The propellers and the strut are cast of non-corrosive high tensile bronze and then polished.

The engine was set up for test at a 12 degree angle to simulate the keel of a ship as shown in the O&R installation drawing. The universal joint, stuffing box, strut, drive shaft, and sealing tube were used to give the same friction encountered (*Continued on page* 66)

Boys! IT'S EASY TO BUILD SCALE MODELS WITH GUILLOW'S *Sensational* DIE-CUT BALSA SHELF MODEL AIRPLANE KITS

VOUGHT CUTLASS F7U

The Navy's first sweptback wing airplane. A transonic fighter designed to operate from a carrier.

RUSSIAN FIGHTER MIG-15

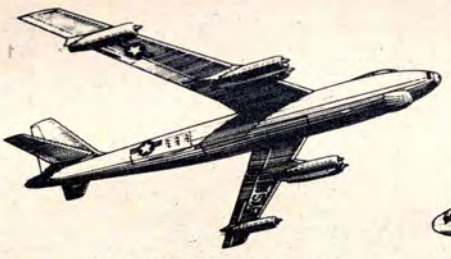
The plane our F-86 Sabre faces in the Korean War. Speed reported to be as high as 680 mph.

GRUMMAN PANTHER F9F

Navy jet carrier fighter seeing service in Korea. Speed in the neighborhood of 600 mph.

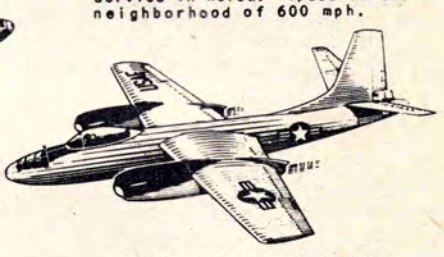
NORTHROP SCORPION F-89

A twin jet night fighter in the 600 mph class. Successor to the famed World War II Black Widow.



BOEING STRATOJET B-47

The most modern Air Force heavy bomber – powered by six turbojet engines – fleet as a jet fighter.



NORTH AMERICAN TORNADO B-45

A new light bomber with twin jet engines – boasts a speed of well over 600 mph.

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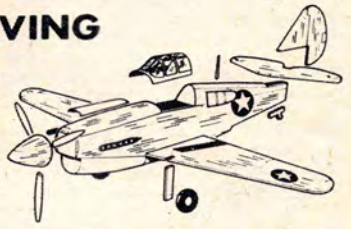

STILL GOING STRONG!

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1950 NATIONAL OPEN STUNT CHAMPION

Trixter BARNSTORMER

1ST IN SENIOR STUNT EVENT - 1ST IN OPEN STUNT EVENT - 47" WING SPAN - 470 SQ. IN. WING AREA - .23 TO .35 CU. IN. DISP. KIT CONTAINS FULL SIZE PLANS, ILLUSTRATED STEP-BY-STEP INSTRUCTIONS AND PRE-FAB PARTS.

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CLASS 1/2A

BABY BARNSTORMER

1/2 SIZE VERSION OF CHAMPION BARNSTORMER FOR 1/2A ENGINES - 23-1/2" WING SPAN - 118 SQ. IN. WING AREA. FLIES LIKE A DREAM ON 25'. - 35' LINES. DOES EVERY STUNT IN THE BOOK.

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GLIDER FLEET: 3 GLIDERS FOR 10¢.
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ADD 15¢ MAILING CHARGE TO ALL ORDERS.

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50¢ — $1.00 ea.

PAUL K. GUILLOW, WAKEFIELD, MASS.

Killers

(*Continued from page* 20)

barrier, more power will not allow it to go any higher.

We see immediately how maneuverability is affected. The speed range at any altitude—that is, the gap between the stalling speed and the critical Mach speed—defines the maneuverability, the tightness of turns, the number of G's that can be pulled in maneuvers; and it is maneuverability that counts in fighter attacks. This then is the graphic picture all *subsonic* aircraft are confronted with, and we can see pictorially how both the B-36 and the B-47 baffle fighters.

The B-47 rides along the critical Mach speed line and challenges any subsonic fighter to catch him. The B-36 flies slower—but it goes higher, up into the corner near the altitude barrier and sits there—forcing the fighter to come on up and fight him on his own terms. The B-36's maneuverability is gone, but what is more important, so is that of the attacking fighter. Only if the fighter can fly at supersonic speed can he catch the fast B-47 type bomber; only if he flies supersonic can he increase his speed-range and regain his maneuverability at extreme altitudes to attack B-36 type bombers.

Let's see how this picture looked to Group Captain "Cat's Eyes" John Cunningham, Chief Test Pilot of the de Havilland Aircraft Co. of England, when he set his world's altitude record of 59,492 ft. in a specially modified stripped-down Ghost-powered de Havilland Vampire. (Each wing-tip had 8 ft. extensions.) At 59,000 ft. he could only fly at speeds between 125 mph indicated (about 400 mph true) and 150 mph indicated (about 465 mph true). If he flew slower than 125 indicated, he'd stall. If he flew faster than 150 indicated, he'd exceed his critical Mach number. He was sitting close to his altitude barrier and didn't have quite enough power to reach it—where theoretically, he could fly at only one speed. As it was, he could only pull a theoretical 1.4 G maneuver, a gentle turn. The slightest over-control would cause him to stall out.

Cunningham couldn't possibly have fought that day. Had a bomber been sitting at 59,000 ft., Cunningham himself would have been shot down from the more stable gun-platform on the bomber, able to train its guns on him at will. For we must remember that up to now fighters must point to where they shoot—and this means maneuvering.

This instance then, shows why interceptors, the goal-line defenders of our cities, must be *supersonic* craft. For when they smash through the sonic barrier, they not only smash through the altitude barrier as well, but regain their original low altitude maneuverability. They can thus successfully chase, catch and attack the bomber and force him to fight his way through to the target.

Our "90" series of penetration fighters approach in performance what interceptors must do. The sweptwing Lockheed F-90, for example, with afterburner added to its two Westinghouse 3,000 lb. axial-flow J-34 engines, is reported to be able to fly supersonically and to get upstairs—probably within 5 minutes. This 13-ton goliath was designed for penetrating enemy lines and has the built-in range to escort bombers. However, with less fuel, it can skyrocket to altitude at fantastic speeds. The only ready-to-go interceptor we now have is the straight-wing Lockheed F-94—similar in appearance to the two-seat TF-80C trainer. The nose is extended to pack in the required radar gear and an afterburner is added to the J-33 engine to shoot it into the stratosphere in a matter of minutes. However, it is distinctly a subsonic airplane and is intended only as an interim model until true interceptors can be made available.

Another modified service type is North American's sweptwing F-93A—a modified F-86 with a Pratt & Whitney J-48 engine and afterburner installed. Flush inlets on the side of the fuselage leave the nose section clear for radar equipment. The '93 therefore vies with the F-94 as an interim interceptor, but only the prototype is in existence at the present time.

Several of the "80" fighter model experimental series could also be used as interceptors. These are the huge 13-ton giants designed specifically as penetration fighters—fast long-range fighters for penetration into the enemy's homeland for either bomber escort or tactical operations against ground defenses. McDonnell's sweptwing Voodoo F-88 is a rip-roaring fast-climbing meteor powered with two Westinghouse J-34-W-34 engines. The second prototype and production models will have afterburners installed, boosting its already impressive performance considerably. The F-88 is a companion design to Lockheed's F-90.

Northrup's straight-wing F-89 Scorpion, while originally designed as an all-weather fighter, carries two jets with afterburners and is equipped with the necessary radar equipment to spot and chase high-altitude bombers. Its rate of climb with afterburners undoubtedly places it within the required 5 minutes to 40,000 ft. category. It is already in production and being delivered to the Air Force.

We see then that only those fighters with afterburners can be classed as interceptors. True interceptors, now on the drawing boards, will probably have rocket motors added as auxiliary sources of power, since their power is unaffected by altitude. Jet engines, you remember, lose all their thrust at about 67,000 ft., and at 50,000 ft. have only about a fifth of their sea-level thrust. That isn't good enough.

The Navy has several fighters with the performance to be classed as interim interceptors against B-29 type bombers. The Chance-Vought twin jet F7U-1 Cutlass with afterburners is a standout contender since, like all carrier borne craft, the wing loading is moderate, allowing better maneuverability at altitude. McDonnell's twin jet Banshee is another fighter with better than average high-altitude performance. However, it is not sweptwing and is without afterburners—both requirements for high-performance interceptors. It too has a low wing loading and excellent performance at the 40,000 ft. level.

The true nature of the interceptor emerges. It will have a great amount of electronic and radar gear aboard, it must be supersonic, it will probably make its attack from the rear since several attacks can be made, and it will use small supersonic rocket missiles—probably with target-seeking devices and proximity fuses. They will outrange the enemy bomber's rear turret cannons.

Such rockets were used briefly at the very end of the last war. The Germans had their R.4/M supersonic rocket missiles. They were unguided, weighed 7¾ lbs. when fired, carried 1.1 lbs. of warhead, and had a maximum velocity of 1,800 ft. per sec.—Mach 2.0 or 1230 mph. Used only during the very last days of the war, six experimental Me-262's each equipped with 48 such missiles once hit a raiding party of B-17E's, destroyed fourteen and returned to base without a single loss. That's the kind of interceptor superiority we must have now.

Such an interceptor must hit 40,000 ft. in less than 5 minutes and 50,000 in less than 10. It must be capable of going to at least 60,000 ft. with sufficient maneuverability to turn inside a subsonic bomber. It must have a combat radius of at least 500 miles and carry complete night-fighting radar equipment. It must have auxiliary power—auxiliary rocket motors for rapid climb and supersonic speed at extreme altitude.

And we need them *now!*

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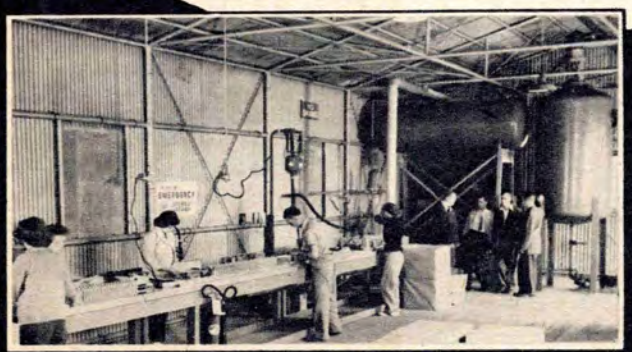
All offers subject to our inspection and approval. Any fuel formula accepted will become the property of the Mel Anderson Mfg. Co.

Note: Any resemblance between the operations depicted above and the production of any home brew fuel is strictly coincidental!



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1819 THIRD AVE., LOS ANGELES 19, CALIF.

Monarch's P-40

(*Continued from page* 52)

the wing and fuselage. The kit includes die-cut fiber pieces for this purpose. They are really tough, and handling will not break them.

The pilot's "greenhouse" comes in the form of a printed sheet of celluloid, which is easily bent to shape and cemented in place. Soft metal wire is furnished to be used as bracing for the enclosure. The cockpit opening is fully cut out when you receive the kit.

The model should be finished olive drab, preferably of a rather dull appearance for realism. A full set of decals is included to aid in obtaining an authentic appearance.

The finished model should balance about 1¼" to 1½" back of the wing leading edge, depending upon the engine installed.

This kit is put up in an attractive blue, orange and olive drab box. The plans and instructions are printed on two large sheets; instructions, outline 3-view drawing, photo of finished model, and numerous assembly detail sketches are on one. The other sheet is devoted to an airbrush cutaway drawing showing details of the assembled model.

Introduction of this P-40F kit, and other true scale control line kits brings up an interesting point that has probably been overlooked by many modelers, especially those rather new to the hobby. Hard as the latter may find it to believe, time was, some years back, when scale building was *the* thing in the model world. This was in the days when rubber power was king, and you built either rubber scale or rubber duration—or you just didn't build. There were kits then, of course, but prefab was unknown. A scale model was built up of dozens of tiny sticks, and most of the best ones were never flown—why ruin hundreds of hours of painstaking work?

When gas engines came in, the scale enthusiasts seized upon them eagerly; if you built an accurate scale miniature of a gas-engine-powered full-size plane, then put in a tiny gas engine to fly it, you certainly would attain the maximum realism. Unfortunately, many of these really beautiful creations failed to fly, and a lot of them splattered. It may have been for this reason that scale modeling went into eclipse.

What a different situation we have today! You can obtain a kit for a realistic model, such as our P-40F, at a reasonable price. Prefab allows you to build the model complete in only a few evenings, and the completed plane is just as realistic as those built-up stick jobs we used to slave over.

The biggest change, though, is in the flying. Even the comparative novice has a very good chance of bringing his scale ship home intact, for those two wires he operates mark the real difference between the scale enthusiast of today and the one of years past. Then he could only heave and pray; now he has constant control. Even the dyed-in-the-wood free flight scale builder must admit that control line flying has brought scale building back with a bang!

Russia

(*Continued from page* 27)

the length. Of medium taper, the wing is moderate aspect ratio, providing a favorable lifting surface while having the sweepback and thin section necessary for high speeds. Bearing this in mind, and taking into account the limited internal equipment and armor of Russian fighters, the MiG-15's wing loading should be something below that of contemporary Western fighters and should make for high maneuverability. That this is the case is borne out by reports from Korea where it has been

found that the Russian machine has a smaller turning circle than opposing USAF fighters.

Another and later swept-wing fighter in service with Soviet Fighter Regiments is the Lavochkin La-17, a slightly larger and slower machine than the MiG (top speed being 630 mph), carrying its 30-degree back-swept wing in a shoulder position. Like the MiG, the fuselage of the La-17 is of circular section, and the tailplane is high-set on the back-swept fin and rudder. However, the empennage is of rather cleaner, more angular lines, and all units of the nosewheel undercarriage retract into fuselage housings, leaving the wings clear to accommodate fuel tanks. Armament is believed to be the same as that of the early-production MiG-15s (i.e., one 30-mm and one 20-mm gun) but, as the MiG's punch has recently been doubled, that of the La-17 may also have been increased.

A simple nose intake is used and the engine aspiration system appears to bifurcate around the pilot, who is seated under a full-blown 360°-vision hood, and exhausts under the tail. Again, the type of turbo-jet installed is not known, but it is probably similar to that used in the MiG-15. Bearing in mind the fact that the wings are entirely free of armament and undercarriage wells, and can therefore house fuel tanks, combined with the sleeker but more rotund fuselage of the La-17, it is feasible that this fighter has a longer range than the essentially short-range interceptor-type MiG-15, and its duties may include those of escort fighter for tactical bombing formations. Range could further be increased by the attachment of drop-tanks, examples of which have been seen on MiG-15s operating over Korea.

The significance of these last-described jets is that they out-perform in many respects the Vampires, Venoms, Meteors and the Thunderjets with which the European Atlantic Pact signatories are at present equipped. What is more, although slower than the F-86 Sabre, they are appreciably more maneuverable at altitude and their larger caliber armament, apart from the advantage it affords fighter-to-fighter, also gives a better chance of destroying our bombers.

Bombing and Ground Attack Aircraft of the Soviet Air Force

Turning to bombers and attack aircraft, we find that well-known wartime types such as the Tupolev Tu-2 and Petlyakov Pe-2 twin-engined machines, and the Ilyushin Il-10 single-engined airplane are still widely used; in fact, over 1,000 Tu-2s alone are still in service as first-line equipment. The Tu-2 is an excellent light bomber with a top speed of 345 mph and a bomb load of up to 5,000 pounds. Normal attack armament is two 20-mm cannon firing forward from the wing roots and free-mounted 12-7-mm Beresin weapons in three rearward firing positions.

Later models, recently introduced, include a higher-altitude bomber, designated Tu-6, which features longer span wings and improved all-round performance capabilities, and also a short-nose version mounting a heavy cannon to port side for assault on ships, strong points, tanks etc.

Although the development of jet bombers was given a lower priority than that of fighters, the Russians have gone to a lot of trouble to evolve an up-to-the-minute jet-powered replacement for the Tu-2. In 1947 appeared a development of the Tu-2 with axial-flow units of M-003 or M-004 type slung beneath the wing in place of the ASH-82 radials. This aircraft, reportedly designated Tu-8, made a brief appearance at the 1948 May Day Air Display and then faded into obscurity, its performance apparently not being considered sufficiently advanced to warrant its production in quantity.

However, at the May Day Display last year, a later jet bomber, also

credited to Andrei Tupolev, made its debut. This machine, which may be designated Tu-10, is known to be in large-scale production and features the unusual combination of a square-cut, shoulder-positioned wing with no sweep or taper on the leading edge and sharply swept-back tail surfaces. The circular section fuselage indicates that a pressure cabin is installed and dimensions are roughly similar to those of Britain's Canberra bomber, span being about 65 ft., length 60 ft.

The pilot is seated under a semi-bubble type hood positioned ahead of the jet intake, the bombardier-navigator is in a glazed nose section and a rear gunner is placed behind the tail with a free-mounted cannon—probably of 20-mm caliber. The turbo-jets are axial-flow units, probably of M-012H type, and are mounted in unusually large, square-shaped nacelles underslung on the wing and protruding well forward of the leading edge. The undercarriage is of nosewheel type; the main wheels retracting backwards into bulged fairings beneath the jet nacelles, and the nose-wheel retracting into a housing in the nose. The latter may be housed in a bulged fairing that can be seen clearly on some ground-to-air photos; alternatively, this bulge may house radar equipment.

Reckoning on some 8,000 pounds' total thrust from the two jets and a normal all-up weight of around 35,000 pounds, a rough estimate of performance gives us a maximum speed of some 530-540 mph up to the tropopause where the corresponding Mach number of about 0.80 can be anticipated as a conservative limit. Cruising range at low altitudes is probably around 800-1,000 miles and the medium altitude cruising speed upwards of 450 mph.

In the long-range strategic bomber category, apart from a few TB-7 and Pe-8 heavies of wartime vintage, the only machine known to be in service is the Tupolev Tu-4, the Russian version of the Boeing B-29, although many unconfirmed rumors mention the Reds' endeavor to produce an ultra-long-range 6-engined bomber in B-36 category.

The Tu-4, which is in service with Soviet Naval long-range units, has been prepared for service by the dean of Russian bomber designers, Andrea Nikolaevich Tupolev, and the conversion of the American B-29 "prototypes" into terms of production drawings must have presented Tupolev's staff with some unique problems. The complex remote-control gun-aiming and electronic gear of the Superfortress may well have been discarded in the Russian version, giving place to manual turret control—although there is no sign of this in the available photos of the Russian production version. Even the Wright R-3350 engines have been copies and redesignated ASH-90, and we must certainly take our hats off to the Russians for having completed such a stupendous task successfully.

Despite the fact that Russia has numerous Tu-4 heavy bombers available for long-range strategic bombing, and the question of whether the Soviet Navy does, in fact, plan such operations, it should be remembered that unlike the U.S.A. and Britain who learned the limitations and effectiveness of the long-range bomber the hard way, the Reds have no such pool of experience to draw upon, and this is one sphere in which ex-German experts cannot help her. The complex navigational problems and target-finding and marking techniques so vital in the successful operation of a strategic air arm have got to be worked out, a process which may take a very long time in peace, and her navigational and radio aids must remain to a certain extent unknown factors until tested under truly operational conditions.

Russian Airborne Forces

Large transport gliders have been taking part in recent air displays in Russia and some of the present Soviet Air Force heavy gliders have been

tested over various AEROFLOT freight routes of late. These facts, together with the large-scale construction of transport airplanes and the mass training of paratroops, the elite of the Red Army, indicate that enough notice was taken of Allied airborne operations during World War II to stimulate the growth of similar forces within the Soviet Union and also her various satellites.

At one time before the war, the Russians had more experience with the dropping and supplying of paratroops than any other power. Moreover, British military observers commented favorably at the time on the strength, timing and concentration of the drops, and the few casualties suffered during such exercises. There are several reasons why these forces were not used on any scale in their airborne role during the war.

Firstly, there was a crucial lack of transport aircraft and the few available were busily engaged in dropping supplies, instructions, agents and so on to the partisan forces. Secondly, there was little opportunity or need to make large-scale paratroop drops during the early stages of the war when paratroop formations were more usefully employed in stiffening the rearguard of the retreating regular field units. When the opportunity for large-scale airborne operations arrived, the paratroop formations no longer existed.

But the Russians now consider airborne forces, well drilled in all the modern techniques, to play an essential part in their future military strategy, whatever that may be. Both paratroop and glider-borne units are in being, and the supply of transports and glider-tugs, principally Li-2s and IL-12s, isn't sufficient to allow the expansion of the Red airborne elements. The Soviet Air Force possesses large numbers of at least two sizable, modern gliders, one designed by P. V. Tsibin and the other by Alex Yakovlev. Both these machines are high-wing monoplanes of simple layout with capacious, rectangular-section fuselages and nosewheel landing gear. Two of these gliders are usually towed by the IL-12, but larger trains will no doubt be towed by such machines as the Tu-70.

Earlier gliders, such as the Antonov A-7 ten-seater of early wartime vintage are used for training, while the most recent mention is of an A-12 transport glider, of greater capacity. This threat of airborne attack should be given serious consideration in preparing for the all-important defense of Western Europe.

Without a doubt, in a long conflict the United Nations' air powers have every advantage of technology and material resources on their side, but the danger at present is that our technically better (overall) but numerically inferior forces will be swamped in the first onslaught. Nor, apparently, can technical achievements in the Soviet Air Force and aircraft industry be underrated. The Russians have immense capacity for mass production, much of it out of range of the existing Western bombing forces; they have unlimited manpower, both in the existing huge formations and in a virtually untapped reserve of semi-trained personnel from DOSAV and similar organizations. Lastly, using the element of surprise, they can attack in any direction, or a number of directions simultaneously at any time they choose. These factors *can* be decisive.

Who can say, therefore, considering facts presented here, that Soviet Air Power does not present a deadly menace to our security, undoubtedly the greatest menace that we have *ever* had to face?

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Air Adventurers

(*Continued from page 30*)

which numbers some 30,000.

Little today is known of just what Russia is doing with its youth behind the Iron Curtain. But all evidence points to even greater air youth activity than 10 years ago. It all feeds into the Red air force which, according to Gen. Carl A. Spaatz, outnumbers us several to one.

One indication is the large number of international model flying records held by Russia and satellite nations. We could beat them, but we just don't bother to do our record flying the way the international F.A.I. rules require.

That is our tragic weakness: we just don't bother in a lot of things until the other fellows get a lead that can be overcome only by tremendous effort.

Anyhow, our Air Adventurers activities are planned with knowledge of what the other nations have done and of the best programs thus far developed in the United States.

The best way to beat a Nazi movement or a Red network is by a program that is American. It is our earnest hope not only that A-A Clubs can be a practical foundation in many communities but that other organizations—civic, youth, veterans, aviation, and others—can incorporate our A-A methods into their own plans for 1951.

In every locality, there are air veterans whose experience will be lost to the nation unless they convey it to young people who will be the defense of the future. Enlist their aid!

The initial Air Adventurers instructions specify that local Flights of 4 members or more, or Squadrons of at least 12, should be formed.

In the Air Force, the Flight is the smallest unit; just a number of men, with or without planes, and a Commanding Officer. The Squadron is composed of a number of Flights, with a C.O. and a staff but not an extensive service organization.

A Group may have Squadrons under it. For example, a heavy bomb Group has 30 B-36s, 10 in each of 3 Squadrons. A medium bombardment Group has 45 planes (B-29, B-50, or B-47) in 3 Squadrons (15 planes each) plus 20 tanker planes. A day fighter Group has 75 planes and an all-weather fighter Group has 36.

While the measure of Air Force strength is its number of combat Groups, the organization is really in "Wing Bases." Each Wing has a combat Group, with its aircraft, plus a maintenance and supply Group, an air base Group, and a medical Group.

In other words, a "95-Group program," the present goal, should mean 95 Wings, each with a combat Group and 3 Service Groups.

In the Navy, a Group with aircraft and maintenance men operates from a carrier which performs all the service functions, much as a Wing Base on land in the Air Force. Insofar as possible, the Navy has spare Groups so if one comes in for rest and reorganization, another can go aboard the ship.

Land-based Fleet Air Wings also are maintained by the Navy for the important function of reconnaissance, to comb all the vast ocean areas where enemy activity may be expected, by use of P2V Neptunes, which hold the distance record. Flying boats with tenders also are used.

Marine Groups may operate from carriers, like Naval Air Groups, or may be temporarily land-based and have their "housekeeping functions" performed by Marine troop units.

So the unit structure is somewhat the same for the three air services. Think of this in planning your area Air Adventurers program. You may, if you wish, simulate either an Air Force, Navy, or Marine air unit in your type of organization and your outlook.

Perhaps you can get some nearby military air unit to sponsor your club!

In any case, there is a fixed pattern of organization to assure that every necessary job is done. In an abbreviated form, this makes sense for civilian as well as military units.

Your local staff should include the functions of personnel, operations, training, supply, public relations, finance, communications, and transportation. Put the right number in each of these "slots" and most of the problems you will encounter can be readily solved.

It can mean a great deal to some of your members—perhaps a majority—to practice along military lines. Play today may be the real thing tomorrow. Talk to veterans and get their advice on how to do it.

Carrier Event

(*Continued from page 49*)

when one flap or the other was blown up by gusts and prop wash. Next time we plan to use bigger springs.

If a modeler cared to tinker a bit he could possibly work out a system that changed the incidence of the stabilizer to compensate for the nose-heavy trim with the flaps down. Drag flaps or spoilers would seem to be the best bet for slowing a model. The dive flaps on the prototype *Skyraider* opening from the fuselage sides and bottom might do the job. These are used for dive bombing and not for landing, so there would be some departure from realism.

The trailing parachute idea could be worked out with a bit of experimenting to find the right size parachute for a particular model. The chute should be vented at the top like a real chute, or better still could be similar to the new ribbon type used for high speed bail-out and bomber braking. The chute need not be as complicated as the big ribbon chutes, but could simply have a number of vent holes around the canopy.

On the AD-2 both wing flaps and arresting hook were lowered by timer action. An old-fashioned photo timer was employed because it had a good strong pull near the end of its travel. The timer pulled a wire which released the hook, the system being similar to that used for free-flight pop-up dethermalizers. The hook was timed to drop after one minute, which gave ample time for take-off and six high-speed laps. Any type timer could be used, such as the Spitfire fuel cut-off with a little modification.

It was decided to build at the top of the class, so to speak. The Carrier Event was flown on 70 ft. lines so a big model and a big engine were chosen. We didn't watch the weight too carefully because we wanted a fairly heavy model that would slow down quickly. This meant better control for the spot landing required. Lighter models have a tendency to float too far and fast. The answer would seem to be high power and fair lifting qualities to carry a heavy model. You can't have everything, though. A light model will fly fast but will float like crazy. A heavy model will not fly fast but will slow down quickly. Somewhere in there is the happy medium, plenty of power for fast flight and low power that will just hang the model on the prop until the time comes to drop it in.

The model doesn't have to be a big brick, however. The exhibition Carrier Event flown at the Plymouth Internationals featured smaller airplanes using O&R 23-29 engines with 2-speed ignition. These smaller models were mostly about three-foot wingspan and were stunt jobs that some of the boys had noodled up with semi-scale Hellcat and Bearcat fuselages.

In the scale category the most suitable types include all the prop-driven carrier-based Navy ships. The general design characteristics of the big prototypes are exactly what's needed when

scaled down for model flying. The list is long. First of all the SNJ trainer, the Grumman F6F & F8F ("Cat" series), the new Martin Mauler AM-1 and Grumman AF-2, ever faithful F4U Corsair and some of the older bombers, Avenger, Dauntless and Curtiss SB2C could be used. And for those with nostalgia in their veins, don't forget the old Hawks and Boeing F4B4 biplanes. The biplanes are even better suited to the model carrier event than the low wings. Their landing characteristics are just what the doctor ordered.

When some bright modeler figures out how to throttle down the Dyna-Jet, look out for the Panthers and Banshees. These will win the event hands down.

If you really want to get fancy, why not a twin-engine ship? The Tigercat F7F and the newer North American AJ-1 are two noteworthy types.

We believe that model design features should follow these rules of thumb more or less for successful performance. Size should be 3 ft. span up to maximum allowable 44". (This can be the wingspan when folded.) Flying on 70 ft. lines in gusty weather at different speeds can get hairy with smaller models. It can be done, yes, but the degree of precision required won't let you wander around the center of the circle during a landing. Your handle has to be right over the center of the circle to put the ship on the deck. Remember it's only five feet wide. One normal walking step either side of the spot and your ship goes in the drink.

Powerplants can be from .20 on up to .60 depending on model size. Some gadget for 2-speed, multiple speed or throttle choke is a must.

Since no stunt flying is to be done, models can have lifting airfoils instead of symmetrical stunt airfoils. Fairly thick 10-15% sections can be used since good take-off qualities are needed. Scale or semi-scale biplanes, high, mid and low wings are all suitable providing balance is right. Your model will have to be trimmed right for this event. If she's nose heavy, she won't get off soon enough and glide will be fast. If it's tail heavy—but we don't have to talk about that!

Some method for slowing down in addition to engine control would be desirable and helpful.

Of course an arresting hook must be built onto the model. It can either be dropped into landing position by a timer after the flight is under way or can be left dangling from the take-off. If the hook is to simply hang, the open end should be doubled back on itself so that it won't catch on the deck. The hook should be firmly mounted in the model since it will take some hard wallops. Size of hook should not be too small. For instance, we used 3/32" dia. steel wire for the 3½ lb. *Skyraider*. The hook did not bend or deform in the landing.

Actually the Carrier Event requires a more realistic type of model flying than any other contest event. Take a scale model and make it do a job like its prototype, and brother, you've accomplished a lot. Wait till they start landing on a 44 ft. carrier deck with R-C models!

Mobilization

(*Continued from page* 16)

of experience by CAP's volunteers.

CDA people sat for months on a plan devised by civil airmen and forwarded by the Air Coordinating Committee. They thought that the lightplane fleet of the country, the only mobile force if the A-bomb comes and paralyzes other forms of transport, is just a sub-subhead under defense transport.

Through lack of organization, private flying has been having a series of narrow escapes against rules which would mean almost total grounding in emergency.

Civil Air Patrol is still the only active unit in most states. Elsewhere, there is little more than a paper plan to register civil airmen for defense duties, and no continuous program of training.

The system of CAP mobile air-ground units for emergency, pointed toward atomic defense, has spread into almost every state wing. As the end of the first six months of organization approaches, a nation-wide survey will be made of results to date.

Meanwhile, many tests are being made, coupled with some practical mission. There is hardly a week in which some CAP unit is not flying search.

In Pike County, Pennsylvania, for example, a CAP search for a hunter brought out more than 1,000 searchers, with planes and ground equipment.

Plans for the annual cadet exchange also are expanding. As we go to press, 150 U.S. cadets will swap tours with an equal number of young people from 14 foreign nations. The deal may be even bigger after Maj. Gen. Lucas V. Beau, National Commander, returns from Europe.

CAP is pushing its air age education program through retention of an aviation educationist, Dr. Mervin K. Strickler, Jr. As an Air Force officer in the last war, he set up the AAF College of Aeronautics under the U. S. Armed Forces Institute.

Spotter program is expanding from 170,000 to a total of 500,000 volunteer watchers and filter center helpers.

From the program organized earlier in the year, the number of filter center locations has doubled to a total of 50 and the number of observation posts has increased from 11,400 to 19,400.

Officials admit privately that the response leaves much to be desired. The public, expecting "push button" defenses from the radar screen, has to be re-educated to the continued need for human as well as electronic eyes and ears.

—KENDALL K. HOYT

Skylark

(*Continued from page* 45)

It will get up and away with the best contest jobs, so administer fuel with care and prepare for a cross-country chase before it is launched.

A feature of this plane is the removable motor unit. The large and small Cub motors can be mounted on separate beds, each forming a complete unit with propeller and fuel tanks that may be quickly inserted or removed as desired.

A 7" diam., 4.5-5 inch pitch propeller is recommended for the large motor, a 6" diam., 4-4.5 inch pitch propeller for the smaller .049 engine. Though comparatively large propellers may give less than maximum "revs" when on the ground, they will turn up to proper speed when in flight.

For tether line flights simply tie the tether line to the loop of the anchor hook that protrudes from the left side of the fuselage. Bend the hook back or forward so the loop end is slightly back and below the C.G. When this condition exists, the nose and wing will droop slightly when suspended by the tether line.

(Complete construction details may be found on the full-size plans available from AIR TRAILS.)

Mount the motor on the stringers as shown. The gas tank is strapped between the stringers and beneath the veneer panel behind motor. A fuel tube extends from tank to engine. The filler tube runs up from tank and through upper side of the cowl. Another tube leads from the vent or overflow pipe, down and out the hole in bottom of nose block.

Before flying the model, balance it carefully and determine the position of the center of gravity. Then adjust

the wing mount forward or backward as required to give the relative location of wing and C.G. shown on the plans.

For flight with the small motor, the wing should be set in the lower notch in the upper rear edges of the wing mount. Set the wing on the rear raised section when the large engine is used or excessive stalling results.

The stabilizer may be set at 0°, flat on the bed for free flight. If climb is too steep with stalling tendencies, a 1/16" block should be placed under the leading edge, as shown, thus providing 1° angle of attack. It is suggested that this block be used for the first test flights. Incidentally, setting the stabilizer at a positive angle of attack (as provided when the block is inserted beneath the leading edge) reduces the nosing-up tendency, flattens glide.

O & R Marine

(*Continued from page 54*)

when running in a boat. The tests were conducted with the propeller fully submerged in water and the engine held stationary. Three different size propellers were tested and the results are recorded under engine data.

The engine was limber enough to start after four or five pulls with the cord and gave very little trouble. After considerable experimenting it was found that a light prime in the exhaust, two drops of fuel in the intake and a slow pull of the cord gave quickest starting.

Three propellers were available for the test and the engine had more than enough power to turn all of them. For general sport boating, the O&R 2-inch propeller should furnish good results, and hold the engine down to 10,000 rpm to give long engine life with minimum wear.

Engine Data

Performance. Weight with flywheel, universal and thrust bearing: 11 oz. Propellers: 1⅛" x 1⅛" 2-blade: 15,000 rpm. 1½" x 1½" 2-blade: 14,000 rpm. 1½" x 2" 3-blade: 13,000 rpm. Fuel: Onlsson & Rice #2.

Design Data. Displacement: .295 cu. in. Stroke: .653 in. Bore: .758 in. Stroke bore ratio: .862. Compression ratio head: 8. Compression ratio base: 1.42. Port area intake: .037 sq. in. Bypass: .477 sq. in. Exhaust: .091 sq. in. Ignition: O&R 3-R racing plug.

Construction Features. Bearings—crankshaft: roller bearing. Crankpin: bronze bushing. Wristpin: steel. Rear end flywheel makes lower engine mounting possible. New type steel aluminum piston construction.

Parts Illustrated

1. Flywheel, steel, 1½" dia. x ¾" long, 3.72 oz. 2. Spacer, steel, .008" thick, .00 oz. 3. Flywheel centering washer, case-hardened steel, ¾" dia., .23 oz. 4. Flywheel lock nut, steel, ¼-28 thread, .08 oz. 5. Flywheel shaft, steel-hardened and ground, .290" dia., .27 oz. 6. Rear cover plate, aluminum die-casting with bronze bushing, 1¼" dia., .38 oz. 7. Rear drive plate, zinc die-casting, 1" dia., .38 oz. 8. Cylinder and base assembly, steel cylinder aluminum die-casting, 2.08 oz. 9. Glow plug washer, copper, .028" thick, .01 oz. 10. Glow plug, steel body, ¼-32 thread, .13 oz. 11. Front cover plate, aluminum die-casting, needle valve assembly, brass and aluminum, .83 oz. 12. Crankshaft, steel-hardened and ground, .359" dia., 1.03 oz. Roller bearing, steel-bronze retainer, .123" dia. rollers, .11 oz. Thrust bearing, steel assembly, .720" dia., .37 oz. Universal joint, steel assembly, .612" dia., .52 oz. Lock nut, steel-case hardened, ¼-28 thread, .04 oz. 13. Rear cover gasket, Vellumoid, 1/64" thick. 14. Front cover gasket, Vellumoid, 1/64" thick. 15. Piston, steel and aluminum assembly, .757" dia. Connecting rod, forged steel-hardened, .50 oz. 16. Connecting rod bushing, bronze, .281" dia., .02 oz. 17. Base bolts, steel, 4-40 thread, .21 oz.

Total Weight: 10.99 oz.

"Pi"

(*Continued from page 23*)

reached the building stage.

Graduating from college, Pi went to work for Platt-LePage, serving as design engineer on the old twin-rotor XR-1. Next he went to the E. G. Budd Company, where he acted as chief aerodynamicist on the all-stainless-steel C-93A or Conestoga. It was here that the now-famed P-V Engineering Forum was formed. This was a rather loose alliance of five engineers; the "P" stood for Piasecki, the "V" for Harold Venzie. There were in addition the veteran plane designer Elliot Daland, whose experience went back to the old Standard Trainer and the Huff-Daland biplanes, Donald N. Meyers, and Walter Swartz. All these men were employed with various aeronautical enterprises in the Philadelphia area.

The Forum began as exactly that—a sort of common pot into which ideas were tossed. Meeting with the others after work in a store-front building in the low-rent section of Philadelphia, Frank Piasecki kept tossing in the idea of the helicopter. His argument was that they didn't have the funds to move cold turkey into an already crowded field; they had to present something radically new. Piasecki, during his college career, had evolved a dynamic balance for a rotor blade. Furthermore, he had evolved a simple system of cyclic pitch control, a system that is still the heart of the Piasecki machines. In this concept he was backed to the hilt by the senior member of the Forum, the present Vice President in charge of Research and Development, Elliot Daland.

So the members of the P-V Forum, lacking money, set about turning out one of the cheapest prototypes in history. They started out with an old

fuselage from an abandoned Curtiss Junior light plane, selecting it because the original was a pusher monoplane, and the beef was aft of the cockpit, where the engine was once set. They were also influenced by the fact that the fuselage was available for the sum of twenty-two dollars. The landing gear came from an old Piper Cub, the drive that delivered power to the anti-torque rotor was salvaged from an old outboard motor. The transmission was an ancient Chevrolet clutch, which was given to Frank by a local auto wrecker just to get the thing out of his way.

From the Rising Sun School the Forum purchased a Vought Corsair fuselage, which was cut up to furnish all the steel tubing necessary for the trial helicopter. As a matter of fact, the only brand-new thing on the whole craft was the Franklin engine. To finance the building of the prototype, one of the partners bought machine tools, and they took on a small subcontract. There was a point when money ran out, and Pi, who had already tapped one of his rather penurious uncles, had to go to his dad for money. "If you've got to build flying machines, build 'em good," said the old tailor, and gave Frank most of his savings.

About this time the Forum was dissolved and a small corporation formed. While the Piasecki machine was still under construction, Igor Sikorsky flew his first helicopter successfully. Instead of taking the steam out of the Philadelphia group's operation, Sikorsky's success drained some of the risk from the Piasecki venture, and capital came in a little easier. In March 1943, the PV-2, the second successful helicopter in the modern sense built in the United States, was ready. Then came the vital decision—who was going to fly it? Despite the huge amount of scientific knowledge represented by the members of the company, Pi himself, with some fourteen hours in a Piper Cub, was the senior airman.

He started off doing the tie-down tests—flying the machine at the end of a couple of ropes, staked to the ground. Here the company's rigid economy program nearly spelled disaster. Pi had borrowed his mother's washline to use as tethers, but the ropes had seen too many Mondays. One gust and they snapped like pack strings, leaving Pi the ticklish job of soloing a helicopter without previous instruction. He made it.

The PV-2 was similar to the Sikorsky machine in that it had a main rotor and a five-foot anti-torque fan on the tail. However, its control system was considerably simpler than that of the early Sikorsky helicopter. Directional control was imparted through a conventional rudder system that changed the pitch of the anti-torque propeller. The control "stick" for fore-and-aft as well as lateral movement was suspended from the roof. The Piasecki machine differed from other pioneering attempts in that the pitch control for the main rotor could be set by the pilot, and the aft one could then be flown with the throttle. For take-off, the pitch control was set in the forward position. Then the throttle was opened, and the ship would ascend vertically. To change from vertical to forward movement, the stick would be moved forward, then eased back to neutral as the aircraft gained speed. To maintain cruising speed the engine was simply throttled back in the conventional manner.

After a rather complete workout, the PV-2 was all set to look at the world. Pi and the crew folded the rotor, hitched the PV-2 behind Pi's car, and towed it to Washington. Here, the matter of lucky timing came in. It was early fall of 1943. The first post-Pearl Harbor tension was over, and people had just begun to talk about postwar industry in a sort of dreamy way. Thus, when a young man with a little personal helicopter that could land in the back yard showed up at Washington's National Airport, it made news—at least

welcome relief from the steady grind of war reports.

The next job was an NACA contract for tunnel testing of the P-V rotor; then came sub-contracts on rotor-head parts and enough business dribbled in to keep the shop working for the next couple of months. During this period, a rather unique thing happened. The Air Force had acquired a number of Sikorsky machines and were doing rather amazing tricks with the "ambitious eggbeaters." The Truman Committee of the U.S. Senate, investigating the aircraft industry, had asked some rather pointed questions of the Navy about this service's lack of interest in rotating wing aircraft.

Since Sikorsky's helicopter production was completely absorbed by the Army Air Forces, the Navy began looking around for someone who could at least take a whack at producing a helicopter for the Navy. Initially, the top Navy air brass had no great enthusiasm for rotating wings. The Coast Guard, however, saw, particularly in the rescue mission, almost unlimited possibilities for the helicopter. The two Coast Guard sparkplugs in the rotating wing field were the late Captain W. J. Kossler and Commander Frank Erickson, the Coast Guard's Senior Pilot.

Through a rather involved procurement procedure, the Coast Guard persuaded the Navy to get the Army to allocate to them a portion of its Sikorsky helicopter purchases. Kossler and Erickson proceeded, in a spectacular manner, to prove their worth. They then started screaming at their limitations—they wanted a bigger machine, and the noise resounded as far as Philadelphia, and Frank Piasecki heard. He rolled up a set of plans for a peculiar aircraft with a banana-shaped fuselage and a rotor on either end, and took off for Washington.

"Now what I want is something like that," Captain Kossler said, pointing to a sort of cartoon on the wall. The caricature showed a standard Coast Guard

Interested in model planes? Like to doodle? Then try your hand at AT's Air-Model Design Contest. It's fun! See page 38 for complete details.

whaleboat with a rotor on either end. Pi unrolled his plans. "Something like this?" he asked.

At the same time, the Navy had a bid out for a helicopter that could carry 2,000 pounds. No one had ever built a tandem helicopter before, much less flown one. There were terrific rumors about how the downwash from the rear rotor was going to unstabilize the front one. Pi had run his wind tunnel tests, and was convinced in his own mind that this simply wasn't so. However, only full-scale test would tell.

When the Navy examined the plans for Pi's flying banana, they may have had some misgivings, but the boy from Philadelphia had the only design that looked like it could do the job. In February of 1944, Pi got the contract to build a fleet of three PV-3's. He moved to larger quarters in Sharon Hill, and the XHRP, known as the "Dogship" rolled off the line thirteen months after the contract was signed. This was a sort of full-scale wind tunnel model, one built virtually without Navy-approved plans. The nation was too busy getting a war cleaned up to worry about a little thing like one helicopter design.

The Dogship flew—and flew well. It was, beyond doubt, the first rotating wing machine with enough payload to be called a serious air transport. Shortly thereafter, the other two XHRP's came out of the plant and were given a thorough going-over by the Navy. When the tests were completed, the Navy issued a letter of intent covering a production order for ten HRP-1s and later for another ten.

Frank Piasecki did most of the test flying on the original Flying Banana, also acting as chief engineer and president. "We had to double up a little in those days," he relates. "We were short of finances."

During the summer of 1945, the Navy's BuAer released specifications for a really tough helicopter requirement; a machine that could do ship-to-shore duty, ship-to-ship communications and transfer of personnel, air-sea rescue, aerial observation, general utility, and yet be able to fold up for minimum space utilization. It had to go down elevators on cruisers as well as aircraft carriers.

Pi grabbed the specifications, put himself on an 18-hour-a-day schedule, and kept at it until the proposal came out, ready for consideration. The Navy, on examining Pi's data, gave him the contract with its tongue slightly in-cheek. They "hedged" the contract by ordering three single-rotor types, "just in case."

By the end of 1946, the company had outgrown its original fiscal structure; while it had over a million dollars' worth of business on its books and a neat little profit for its first year of big-time operation, Pi's plans for the future of the company needed not only additional financing but some solid financial background on its board of directors. Pi approached some of the leading venture investors on the aviation scene; Lawrence Rockefeller, Nicholas Ludington, Douglas Dillon, Felix duPont Jr., William Harding, John Story Smith. These men raised funds that permitted the Corporation to acquire the 55-acre site in the Philadelphia suburb of Morton, and begin the building of the present steel and concrete plant.

Out of this new plant has come the HRP-2, the all-metal version of the original Flying Banana, essentially the same design as the original Dogship, but cleaner in general lines. There is an Air Force version of this design known as the H-21. This machine is powered by a Wright R-1820 engine, instead of the 600 hp P & W R-1340 that powers the HRP-2. This craft is built for Arctic rescue, and is fitted with the so-called "omniphibious" landing gear that permits the machine to land on solid earth, water or tundra marsh.

The Piasecki answer to the fleet helicopter bid was the HUP-1. This machine, powered by a 525 hp Continental radial engine, was much shorter than

the previous ones. Experience with HRPs had borne out Pi's experimental proof that the two rotors, moving in different planes, would not interfere with each other. The HUP's fuselage was more conventional in its shape, while the pylon for the rear rotor resembled a high and thickened fin. With a unique system for folding its blades, it was small enough to be carried below decks on a cruiser elevator, or on even an escort carrier lift with its rotors unfolded.

(*Continued on page 73*)

Stunt Rocket

(*Continued from page 35*)

slightly and all strips should taper uniformly towards the tail. Sand fuselage well when dry.

Bolt engine in place and add the Froom aluminum spinner to it. Now select soft balsa blocks for nose pieces. These are cemented lightly along horizontal center line and carved roughly to shape. Separate the blocks, and hollow them around the engine.

Cement the blocks to plywood bulkhead "B" and to each other, again very lightly, and this time carefully carve blocks to fair smoothly between fuselage and spinner. Sand smoothly, then remove and hollow as plans indicate. Fuel-proof the cowl interior and replace nose pieces, this time permanently.

Fin is cut from plywood sheet and sanded smooth. Cut a recess in fuselage top and cement fin securely in place. We covered the fuselage, a small area at a time. After this operation, three coats of clear dope were applied with light sandings between each coat. The prototype model is colored red and white with a gray cockpit enclosure. Apply three coats of white dope and mask off, then add red dope.

Be sure to use fresh tape at all times and push edges close to model's sur-

face with your fingers to prevent color from seeping through. The white leading edge trim, rocket insignia and all lettering were made from Trim-Film. Two coats of transparent fuel proofer should be applied to entire model.

In view of the fact that model was flown without any landing gear, we operated over a grassy site and in this way the belly of model did not get scratched during landing. Take-offs were not hampered by the grass because of forward location of gear and large size of wheels.

If a fixed gear is used we recommend as smooth a flying site as possible. Our initial flight was conducted with .016" diameter lines, 60 feet in length. Once we were familiar with the flight characteristics (extremely maneuverable with moderately high speed—70 mph), we graduated to seventy and then eighty foot length of .016" stainless steel flight lines. It is with these longer lines that the model really does its stuff!

We experienced no difficulty in keeping lines taut with the fin offset shown. However, should the model indicate a tendency to turn toward the circle center, a one or two degree engine offset should remedy this condition. If balanced as shown and built carefully and flown with good sense, the *Stunt Rocket* will provide many flights that are truly "out of this world."

Bill of Materials

Fuselage. 1 pc. ¼" x 2" x 36" hard balsa, keel. 1 pc. ⅛" x 2" x 18" medium balsa, formers. 1 pc. 3/16" x 3" x 3" plywood, bulkhead "B". 20 pcs. ⅛" x ¼" x 24" medium soft balsa, planking. 2 pcs. ⅜" x ½" x 6¼" hardwood, engine mounts. 2 pcs. ⅛" I.D. x 1½" brass tube, L.G. sockets. 2 pcs. 3¼" x 3¼" x 1¼" soft balsa, nose blocks. 2 2½" dia. or larger rubber-tired wheels. 1 pc. ⅛" dia. x 36" music wire, take-off gear. 1 sheet Silkspan, covering.

Wing. 7 pcs. ¼" x ¼" x 36" hard balsa, spars, leading edge. 6 pcs. ⅛" x 3" x 36"

medium balsa, ribs. 1½ pcs. 1/16" x 3" x 36" medium balsa, trailing edge. 3 pcs. 1/16" x 2" x 36" medium balsa, webs. 5 pcs. 1" x 3" x 36" medium balsa, covering of center section and leading edge. 1 pc. 1" x ½" x 2" hardwood, bellcrank mount. 1 pc. 1/16" dia. x 18" music wire, control rod. 2 sheets heavy Silkspan, covering. 2 pcs. ½" x 3" x 18" medium balsa, wingtip and plates. 2 pcs. .032 dia. x 36" music wire, lead-out lines. 1 pc. 1/16" x 3¼" x 1¼" dural, bellcrank.

Empennage. 1 pc. 1/16" x 3" x 12" plywood, fin. 1 pc. ¼" x 3" x 24" hard balsa, elevator. 1 pc. 1/16" x 14" x 1" dural, horn. 12 ¾" x 1" crinoline hinges. 1 pc. 3/32" x 1½" x 6" plywood, sub fin. 1 pc. ¼" x 2" x 22" hard balsa, stabilizer.

Miscellaneous. Clear dope, cement, white dope, red dope, grey dope, masking tape, brass washers, Froom Spinner, Trim-Film, brushes, fuel proofer, 1/0, 2/0, 3/0 sandpaper.

Flying Wings

(*Continued from page* 38)

nose up into stalls and then dives, and repeats this action until it dives into the ground, the C.G. is too far back. Add more balance weight. Of course, this will produce diving tendencies. Correct by giving the tips more negative angle.

We seem to contradict ourselves. Here we have a model that has stalling tendencies which we correct by adding weight, only, seemingly, to bring back stalling by giving tips greater negative. All we can say, try the system and you will be surprised. Carry on this procedure until the model just "shimmies" into a smooth flight when it is upset.

The top design model selected is a combination of compromises. Notice its large size in relation to the power used. This will discourage looping yet

(*Continued on page* 74)

"Pi"

(*Continued from page* 71)

Still this machine could carry a crew of two, five passengers or three litter cases. It was furnished with a large door for the loading of low-density cargo, and carried a hydraulically operated hoist for rescuing personnel while in flight. The rescue hatch was designed so that the pilot could pick up ditched personnel at sea without outside help. This ship proved the fastest United States production helicopter with a top speed in excess of 135 mph.

Pi's major project today is the giant XH-16, which is being built for the Air Force. While exact data has not been released as yet, the new job is to be a twin-tandem motored helicopter with a fuselage the size of a DC-6's. The XH-16 will be furnished with two interchangeable landing gear systems —one would be a normal length gear, for ordinary personnel pickup services, the other a long stilt-like set-up, so that a capsule like the pod on the Fairchild C-120 could be slung underneath.

Pi himself lives this helicopter business on a full-week basis. He will deliver scientific papers, Rotary speeches or plain bull-session arguments on this subject anywhere he can do the cause any good. He is a favorite witness before CAB hearings on helicopter route franchises, since he knows the subject cold, and still has no ulterior motives, since he builds no commercial aircraft.

When asked to name the most important advance in recent helicopter development, Piasecki indicated that the A-12 autopilot's application to the helicopter was a great step forward, in that it permitted the pilot to fly with the same degree of relaxation as fixed-wing personnel. Furthermore, it eliminated the auxiliary fin surfaces required on many helicopter designs to achieve directional stability.

Then the last question: what happened to the fiddle? Well, Pi still plays—chiefly at company parties.

provide fairly good climb. Since reflex airfoil complicates construction, Clark Y type airfoil is used in combination with 30 degree sweepback and 10 degree washout at the tips. To provide control and adjustments, the tips are adjustable. Rudder is generous to provide smooth towing. Also, this model can be used as a glider and as a powered model.

A feature was the claim that this particular type of construction—balsa covering leading edge and caps on top only—would automatically produce washout after the paper had been water doped. Since it is a complicated procedure to plot out ribs with gradual washout change, we gave the idea a try. It worked out as per claim. Not only once, but twice, since the first model was lost out of sight while making glide tests.

After the ribs are cut, the wing is assembled as usual. Join the two halves so that correct dihedral is obtained. You may have a bit of trouble covering with balsa sheet. But if you use a uniform and almost quarter-grained balsa sheet, you will find that it will follow the rib outline without trouble.

Before covering with sheet, shape the leading edge so that it will "flow" with the rib outline. Otherwise it will be difficult to obtain smooth covering.

Cement the sheet to the leading edge first. Let the cement set well before bending it down to the ribs. Use weights to hold it in place. After the sheeting is done, cement cap strips in place. Note that lower or bottom portion has no sheeting or capping. But do not forget the wide capping at the bottom center to which the keel is fixed.

Cover the wing with wet Sky Sail. Although the construction will automatically produce washout, it is wise to prepare a drying jig so that the tips will have about 10 degrees negative.

After paper has dried, apply several coats of clear dope to prevent it from tearing while you work on the center section.

Cut keels "A" and "B" to outline shown, and make the firewall to size. Cut leading edge to provide a square face for the firewall. The keels will automatically position the firewall at the required angle. Note that it is negative in relation to the center airfoil. Cement "C" corner blocks.

After keels and firewall are set, form the streamlined fairing. Start by cementing the sheet to the keel, and then cut to approximate outline to fit the airfoil. Paint finished fairing with several coats of cement and dope mixture to obtain hard surface.

Note the addition of extra ¼" balsa block to obtain good foundation for spinner fixing. The spinner is cut to fit the engine you will use, and it is held to the firewall by three wood screws. When flying the model as a glider, use the front portion of the spinner. You might have to use a wedge to hold it in place, or you may find a screw to fit and so hold it in place.

Finish the model by adding the adjustable tip tabs. Use copper wire for hinges. Trim to suit but do not use much colored dope. Keep weight low.

Since the model has a gradual washout, it is impossible to find the exact average chord on which we can pin the 25% C.G. spot. However, the original model balanced as shown on the plans. Therefore, place enough clay in the spinner to bring the C.G. to the spot indicated. Now try some glide tests. If the model dives, use the tabs to bring it to smooth glide. If it stalls, add more weight—remembering what was said about how to find the best C.G. position by observing the flight pattern.

Do not attempt to force a definite turn on the model. Let it follow its built-in setting. Of course, if it is too violent, use the tip tabs. As you may know, always use "up" adjustment. If you want the model to turn to left, "up" the left tab. Moving the tab "down" does not work out as per aileron effect as one would expect.

The original model was quite easy

to tow. But we must confess that the turn setting was not very powerful. Tighter turn setting may require auxiliary rudder control. In connection with tight turns you will find that you may have to "up" the tabs to prevent steep spiral descents. This is normal. Leave balance weight alone once you have obtained a smooth and stable straight glide. Make all flight corrections with the tabs.

Do not expect spectacular climbing ability from a Flying Wing. It is not made for that sort of work. If you had automatic control, the situation would be different. But if you expect the model to have a good glide after the power is out, be satisfied with moderate and controlled power flying.

If the model has stalling or looping tendencies, reduce power by changing props, or adjust for a climbing turn if stalling occurs in a straight flight. If you follow this procedure, you can count on having a lot of fun with your Flying Wing.

When designing your own, remember the basic position of the C.G. at 25% point. If you do so, all other factors will be automatically adjusted for this condition and a stable Flying Wing can be guaranteed.

Roundup

(*Continued from page 39*)

fuselage built along the old *Interceptor* lines. The motor was ahead of the wing about 5 in., so he could balance without adding weight. Needless to say they really flew good.

Pat Regen Jr. of the *San Valeers* flew a slick new 197 sq. in. Wasp job: 42 in. span with a 40% tail and a tail moment of 55%. The ship had a nose that was brought down to timertank size from a well-faired cabin. Wing and tail leading edge was sheeted; complete weight only 5.5 oz.

Bob Wiehle's *Halfpay* was beyond doubt the cleanest and best-looking Half-A PAA-Load model. Sporting a husky 225 sq. in. and a 40% tail, the Wasp was inverted and fully cowled. Bob also had a timertank, modified so he could use the inverted engine. He used the standard back plate, then cut the portion of the tank off which normally fits inside the crankcase; an extra gasket completed the job.

Squire Openshaw Jr. of the *Alameda Prop Spinners* had what was probably the most unusual model at the contest. The ship was 8 ft. in span and featured a 44 in. Vee tail with a centrifugal anti-spin device linked to the underslung rudder. This consisted of a spring-dampened one-ounce lead weight mounted on a fulcrum and tied to the rudder with pushrod and bellcrank. When the model starts spinning the weight swings to the outside of the spin, pushing the rudder to the opposite side and causing the ship to come out of the circle.

Charles Primbs of Santa Barbara, now attending Cal-Tech, was another fellow who believes in clean design. Charles' ship was a high aspect design with both the wing and tail being of 10:1 aspect ratio. Both were sparless, with the wing sheeted on the leading edge. This Arden .099 powered *Urps*, as he calls it, was only 250 sq. in. in area and had down and outswept tail skid fins for good ground stability.

W. H. Casselberys, who is secretary of the *High Tailers*, flew what he called a *Sleek*. The Torp 29-32, B-C job had 750 sq. in. in the wing, with a 45% tail. The wing construction was a little unorthodox where he used twelve 1/8" sq. spars; the tail was also multisparred. The entire front half of the pylon as well as the front top half of the long 5 in. nose were carved and faired from a balsa block, which made for a real clean fuse-pylon entry.

One cannot say enough for the super beautiful *Zeeks* that Toshi Matsudo flies. His fuselages are so smooth that you can't find a trace of the wood grain,

while the wings and tails are colored with those flaming fluorescent dopes.

One item which our present rules do not cover was brought out at the Bakersfield meet and deserves a lot of consideration. This is the unethical practice of entering ships as a team. Two fellows after some thought and consultation with the rule book decided to pool their models and enter as a team. Since there is no strict definition as to how much work each must do on the models, on the surface this seems an easy out.

As they had it planned, each was to fly certain models and therefore get in more flights in more events. Doing this is in order to win sweepstakes is much the same as putting two good boxers in the ring against one, each fighting at the same time or taking turns. Along these same lines of thinking it would be possible for as many as six to enter the Nats as a team and walk away with the National Championships. Each fellow could be a specialist in his own right. One could be a rubber and glider specialist, one in free flight gas, one in speed, another in indoors, another in stunt and the other in flying scale. All they would have to do is have one fellow launch or fly the models.

Fortunately in this one case the fellows involved were broad minded enough to understand that the rules were not set up to allow this sort of thing, so to make matters right, they disbanded their team and entered as individuals and did all right for themselves. A ruling should be made at once clarifying this situation.

The Wakefield warm-up meet held by the *Thermal Thumbers* provided quite a few surprises when the experts failed to place. Ed Slobad and Lo Salisbury had take-off trouble. Dick Everett came a cropper due to an upside-down nose block; Red Everitt wisely decided not to fly when the wind came up. Originally scheduled for Fontana, the meet was transferred to north of Loyola Village when a 40 to 50 mph wind blew up.

Hal Roth who now flies with the Oakland *Cloud Dusters* continued on his winning ways with a fine total of 10:50. Andy Faykun, a newcomer to the winner's circle, was close behind with 9:22, while Ray Berens flying a *Witch Mk II* came in third.

Faykun, well known to all Southern California modelers, has been attending and entering contests for years. Andy is handicapped considerably, having to use crutches to get around, but this does not dampen his enthusiasm for model flying. If this second place is any indication, his fine-flying, well-constructed models will be on top for a long time. Andy has in the testing stage a geared Wakefield which he hopes to accompany to Finland. This model is a little unusual since the gears are in front and the two motors turn the prop at a speed higher than the rubber.

The Los Angeles Model and Hobby show brought out a few new wrinkles including the Torp 19. Les McBrayer, Keith Storey, and Rudy Panko of the FAST Club stole the show with some wonderful precision team flying with their Half-A team racers.

Spectators were amazed at the step-team flying these three flyers did. John Brodbeck Jr. and Larry Goodale put on some dogfights with Firebabys.

Charles Schuette placed a Torp 19 in one of his Class A speed jobs and on the very first outing did 124 plus mph on a 6/10 Tornado. Dick Everett's old payload *Lil MacVoot* has taken a new lease on life with a climb that compares favorably with free flight contest models. The engine has proved to be an easy starter and can be very easily modified for radial mounting—so popular with the contest modeler—by making a plate to fit the rear crankcase cover bolts; use countersunk screws instead of fillister, allow the plate to extend past the engine and drill four ⅛" holes for mounting to your firewall.

Rudy Panko has a semi-scale Goodyear Racer with a Mac 19 which has

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reportedly done almost 85 mph. In an effort to establish rules for this new class, the FAST Club is building these Class A models. Keith Storey has a new job with an inverted engine which really looks good. Lawrence Williams has an all-metal Half-A job weighing only 8 ounces which somewhat resembles a Mustang. Chet Schmidt of the *Hawthorne Sky Burners* is continuing his experiments with Flying Wings. He showed his latest off at the contest and it performed very admirably. Powered with a O&R 23 and weighing 1½ pounds, the ship had to be hand launched but the flight was successful. He calls it the *Schnoo.*

The *La Mesa Airfoilers* beat the *San Diego Airliners* at their last inter-club meet by over 400 points, making two times in a row that they have creamed the Airliners. The Airfoilers need only one more win to retire the trophy.

The whereabouts of Denny Davis has finally been solved. Paul Gilliam reports he is staying in Lubbock with him while working for the government. The West Coast is waiting for their latest creations. Will each swing the other to his way of thinking or will it be a combination of *Civvy Hogan?* Time alone will tell.

Ray Van De Walker, formerly of the Va. Brainbusters, is now attending contests out here. Roy has just graduated from Northrop as an aeronautical engineer and is working for North American. His win in the Half-A PAA-Load event at Bakersfield was surprising, since he flew an Aeronca Sedan *scale* model. The Berkeley kit was modified a little; flights were swell.

Del Swartz who usually wins every beauty event on the Coast is now working for Douglas. In his spare time he is building some display 1/10 scale models for Radioplane. These ships have all exterior details.

One international event which not too many fellows know about is the Nordic A/2 glider contest. These models, like the Wakefields, are built to certain specifications that are relatively simple. Wing plus tail area must be between 495 and 526 square inches. Minimum weight 14:46 ounces. Minimum cross section must be total area divided by 100, which is very small. Towline length is 328 feet maximum. Since Stepjan Bernfest of Yugoslavia was top man at the contest held last year in Finland, the 1951 meet will be held in his country in August. There will be at least one United States entry at this year's contest. The ship built by Dick Everett will be flown by Ron Warring of England.

Continental Nordic models usually feature two-piece wings with flat center sections and tip dihedral. All ships are carefully built to weight with the Scandanavian ships being made of hardwoods such as pine and spruce. Launching techniques have been developed to such a high skill that 300 feet altitudes on the 328 feet towline are common. Small steel wire is used more and more as the towline, usually equipped with a small parachute on the end to allow the launcher to reel in the line before it touches the ground.

—DICK EVERETT

SPECIAL DEMONSTRATION AT NATIONALS

George Gardner, educational director for Pan American World Airways, announces that there will be a special PAA-Tow Load event run off at the Dallas Nationals on a demonstration basis to determine how much interest there may be in such flying. Object will be to see how much weight a model glider towed into the air behind a Half-A powered free flight can lift for 40 seconds. Both towing model and the glider must R.O.G.

Battle Report

(*Continued from page* 47)

year, will again be one of the contest's features. Again this year flying scale enthusiasts will be allowed to enter any type of flying scale model, rather than being restricted to replicas of a specific plane.

The Fifth International will feature 31 outdoor events for rubber and gas-powered free flight models, hand-launched gliders, gas and jet-propelled speed planes, team racing, flying scale, control line combat, and Navy carrier deck operations.

Participation at Detroit will be open to boys and girls in three different age groups: freshmen, 11 years or under, not yet 12; junior, 12 to 15, not yet 16; senior, 16 to 20, not yet 21.

Winners in each event in the junior and senior classes will receive the following prizes: first place, a $100 U. S. Savings bond and a beautiful permanent trophy; second place, a $50 U. S. Savings bond and a permanent trophy; third place, a $25 U. S. Savings bond and permanent trophy. In the freshman class there will be a permanent trophy and a $25 U. S. Savings bond for first place winners, and permanent trophies for second and third place winners.

Dope Can

(*Continued from page* 39)

it was a rare occasion when model activity had to be held up briefly for a plane take-off or landing. Starting in 1940, full-scale activity had reached greater proportions and the modelers shifted their operations to the Mexico City military airfield.

Free flight powered events are run off similar to those in the U. S. with the same timing rules applying. Plymouth representatives report that there are about 300 active modelers in the Mexico City area, 50 in Monterrey, and no more than 500 in all Mexico. Activity is almost at a standstill in the first three months of the year because of extremely high winds. Another handicap is the high altitude at which most of the flying takes place—7340 ft. is the average. This reduces engine output by 20% and lift an additional 20%. Special fuels are concocted because of this. When a Mexican gas model gets to the States as did some in the recent Orlando, Fla., Tangerine meet, they prove to be tremendously overpowered.

Free flight continues as the most popular event. About 65% of all modeling is in the power categories and only a small percentage of that is control line flying, and mostly stunt work, little being done in speed. Up until a year ago free flight designs were what we'd consider pretty ancient. Then American-type contest ships were tried with terrific results. Reason: thermal activity in most parts of the country is very heavy. So all models must be equipped with dethermalizers or are sure of being lost.

Interest in rubber modeling is suffering because of the Half-A engines. Radio control is in its infancy. The leaders of club activity are expecting that a team at the Plymouth International meet will give a good account of itself in free flight. A country-wide Federation has been formed with Jose Tellex as president; Alberto Vela, secretary. Most of the club members are over 21 because of the high cost of materials. The hope has been expressed that possible government interest in the modeling activity may make it available to younger enthusiasts on a much broader scale.

Air Force Meet. All modeling activity is plenty significant to our way of thinking, and it'd be pretty hard to distinguish between various events and say that this one was more important than that one. Many a seemingly small affair

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has led to big undertakings—including such things as National contests. But permit us the liberty of stating that one affair in mid-April was really important. This was the Sheppard AFB (Texas) meet, a prelude to the USAF Model Airplane Championships scheduled for the same air base July 16 through 21.

This was an invitational affair sponsored by base's *Tailtwisters Club* with civilians as well as military personnel performing. From Offut AFB, Nebr., Lt. Col. Harold Babb and a contingent of airmen came to participate as well as gain first-hand operational experience in conducting additional AF competitions. From Keesler AFB came another team of 15 contenders. Even though extremely high winds were the order of the day, more than 18,500 turned out to witness the performances of the 75 contestants.

Lt. Harry G. Vogler, Jr., and Sergeants Al Temple and William Sinclair are to be commended for doing a bang-up job. Among other things the officials elicited the first names of the famous speed team of Massey and Hall from Pampa, Texas. Turns out that Massey is "Pat" and Hall is "Babe." This pair, flying as a team, walked off with the high-point trophy, took three "firsts" and set a new national speed record of 129.483 in Class C U-control with their McCoy 49 powered entry.

Flying Space. Are you familiar with the history of model planes? In the early part of this century aviation enthusiasts, mostly adults, met to test their aeronautical theories with models. In the beginning these were flown in armories for the most part. Straight-line flights were the goal. When models would finally fly from one end of an auditorium or armory and crash against the far wall, the infant sport moved outdoors. As "straight-line" flying progressed you could find many an early modeler complaining about the lack of available flying sites.

Through the years enthusiasts learned to adjust their models so they would fly in circles and the stop watch rather than the tape measure became the method of comparison. Then came the early gas engines. Models flew higher, flew faster, flew longer. And the complaints about suitable contest or practice fields grew. Lots of folks turned to U-control with much glee when that phase of the hobby came along. Ah-ha, they said, now we can fly in smaller fields.

You think the trouble regarding sufficient flying room diminished? Not a bit. Mike Geraci's story is typical. He lives at 347 Lyons Ave. in Newark, N. J. He says that enthusiasts in Newark and surrounding communities have a problem: how to keep model flying alive if there's no place to fly their models.

"The fellows in this area," he writes, "used to fly at Elastic Stop Nut Corp. in Union which was an ideal place. It was large enough to accommodate many flyers at the same time. It was open to everyone and you had the chance to meet other modelers. Since flying has been prohibited there everyone has scattered looking for other places. Baseball diamonds are about the only fields to be found and with the baseball season in full swing we're out again!"

Mike wants to know what happened to all those old slogans he used to hear so much about—"Keep our youth air-minded," "Keep 'em flying," and the like. Fine encouragement when you can't even find a place to fly!

Is there any way we can help, asks Mike?

This is a pretty old problem as we indicated above. However, all is not lost. There are folks who may be able to assist you. The best thing to do is enlist the aid of influential folks in Newark or surrounding cities. Start with the Exchange Club. Arrange for a meeting with some officer of that group. Take along a representative from each club you can contact. The Exchange man will understand what modeling is all about, he has read plenty about it in his Exchange magazines. Other possibilities: the city recreation department, YMCA, any small airports in the vicinity which may have shut down activities. How about other parking lots? Any around? Any race tracks or stadiums with large parking fields? If there were a Navy auxiliary air field nearby, we'd advise you to try that, Mike. The Navy has indicated it wants to help.

Mostly, whatever is done must be done by the modelers of the community. That's why representatives from every club should get together and map out a course of action. Write the AMA for

ADVERTISERS' INDEX

July, 1951

While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this July, 1951 index.

the names of leader members in your section of the state. We'll bet they have some suggestions based on the local conditions. Ask your hobby dealers and distributors for help in finding a flying site; talk it over at school with any teachers who will lend a sympathetic ear.

With the Organizations. Boston, Mass., *Balsa Bees* have inaugurated a "help-the-youngsters" program. They were planning to build a model aircraft carrier but so many members have joined the Air Force that at the moment the club is too short handed for such an ambitious project. The U-control club's 7th anniversary was celebrated recently (Myron S. Wolf, 6 Colliston Rd., Brookline 46, Mass.) . . . Another club hard hit by the draft and enlistments was the Philadelphia *Sky Demons.* PFC Lloyd E. Jobson reports from an Alaskan air base that practically all the members enlisted in the Air Force . . . The Battle Creek, Mich., *Gasoleers* meet the second and fourth Wednesday of each month and hold a contest each month for members (Dale R. Hanlan, c/o Miller Jones Co.).

On June 23rd and 24th the *thirteenth* Southeastern Regional Model Airplane Show sponsored by the Atlanta, Ga., Exchange Club goes on at Fulton County Airport. More details from R. H. Elliot, Georgia Congress of Model Airplane Clubs, who assures us Box 5078 is the correct address . . . R. S. Hunteman, Box 191, Vernonia, Ore., reports on the establishment of the *Goonies* MAC. The group wants a Burgess M-5 engine. Anyone want to sell 'em one? . . . Portland, Ore., *Stardusters* are up to 22 members; only steady model builders are admitted to membership. The club's third annual free flight contest was set for June 10 (Robert Kern, 5023 N.E. Union Ave.) . . . Scottsbluff, Nebr., has a model club. Chuck Adkins, 2017 Broadway is the contact man.

The famed New York *Aeronuts* have relaxed their rigid membership requirements; as a matter of fact according to Stan Barbakoff, president, they are seeking "comparatively inexperienced model builders who want to learn to fly to join." Quite a change in policy. Other new officers include Gary Garob, veep, and Frank Santore, treasurer. Anyone interested in joining may reach Barbakoff at 39 Scholes St., Brooklyn 6 . . . Bath, N. Y., *Prop Busters* ask all model clubs to put them on their mailing lists. Bernard Zawrotny is the secretary (RFD #4).

Twenty-eight *Plymouth Aero League* clubs are active in the Greater Detroit area. Indoor and outdoor activity goes on the year around. The PAL club brings organized model building activity to more than 900 elementary and intermediate school boys; it is sponsored by the Plymouth Dealers of Greater Detroit . . . Cape Girardeau, Mo., checks in. William R. Booker reports that "we are trying to get a club started and get the younger sprouts interested in

modeling but it has been rather slow and discouraging so far. The main difficulty is the unavailability of modeling supplies as there's no supply shop. Everything we use has to come through the mail. However, we are starting the beginners on gliders as the most suitable medium and for fine flying with small expense. Our president is Ernest Miner, 541 S. Hanover St."

Small but active New Jersey group is the Leonardo *Propwashers*. The ten members compete in all northern N. J. meets. Kip Mitchell, 56 Washington St., Rumson, N. J. is corresponding secretary . . . Frank S. Pavliga, secretary of the *Mahoning MC* of Youngstown, Ohio (2700 Market St.) sends along a fine account of his club: "Since its organization in 1938 the activities of the MMC have been many and varied and, as in most clubs, a spirit of fellowship prevails. Many fine men have been developed from the ranks. Currently the club consists of 38 members and is divided in Senior and Junior divisions. This method of operation has proven very satisfactory over the past several years and Pavliga enthusiastically recommends it to other clubs. If other model groups are composed of equally lively members there is a marked tendency for the younger members to indulge in activities not conducive to a systematic and orderly meeting."

Well, that's one way of putting it.

"Accepting the fact that boys will be boys," writes Frank, "the club took the only logical step—separated the club into a Senior group and a Junior group, with separate meetings for each. Our amended constitution calls for mass meetings of both clubs once every three months for the purpose of unified operation. We have found this system to be a simple and efficient method of conducting a model club and as a result the MMC has been progressing steadily. Of special interest is the fact that since its formation it has had the same faithful sponsor—the Kirchner Hardware & Model Supply Co.

"Over the years movies have been taken at various contests and gatherings and these are reviewed by the club periodically. This medium, we feel, is one of the most permanent and valuable records any model club can have in its files. It is with much enjoyment that we view our activities of the past, including the numerous laugh-provoking incidents that are bound to occur when modelers perform. The club is making a movie on model aviation, showing in detail the story of rubber-powered flying, free flight, control line and even experimental projects. This movie should do much to further model aviation in the Mahoning Valley (now we know where the name comes from)."

Milwaukee Story. The Milwaukee, Wis., County Park Commission has designated seven parks for model flying which certainly encourages activity. Victor Weissbrodt tells us that a radio control club of 22 members has been formed called the *Flying Electrons*. Vic is president, Don Maly, the speed king is vice pres., and Al Secklin, treasurer. The *Aeromodelers* (6029 N. 38th St.), another active Milwaukee club, are expected to run off the U-control section of their big meet on June 17; free flight events will be held on June 24th according to current info. An indoor site has been secured in one of the school gyms; record trials for all types of models are run off regularly.

Most Active Club, etc. As a junior member of the *Prop Spinners* of Long Island, R. L. (Bob) Hatschek, club president, takes violent exception to the *Gas Monkeys'* statement in a recent AT that the latter organization is the oldest, most active, non-reorganized group in the East. Bob, incidentally, calls himself a "junior" *Prop Spinner* because he's been a member for only 10 years!

"Since the Long Island *Gas Monkeys* have seen fit to pass questionable re-

marks in the Dope Can," pens Hatschek, "I feel that we must defend our position against this infant among model clubs.

"They admit we are an older club by qualifying their own claim with the phrase 'without reorganization.' I wish to point out that the *Prop Spinners'* reorganization was merely a membership drive. It was perhaps a shot in the arm, injecting some fresh young blood into the veins of the venerable model organization. It would seem that our term 'reorganization' was a poor choice of words. Though the members were not attired in their familiar yellow and blue shirts . . . many *Prop Spinners* . . . walked off with high places during past seasons. It will happen again this season! And you'll be able to recognize The Elite of the East by the new and yet familiar yellow and blue shirts displaying the bandaged finger insignia of the *Prop Spinners*.

"Our membership now stands at 40. Among our membership we include three former Wakefield team members, some of the best indoor flyers in the world, a dozen radio-control experts, the man who had held more national records at one time than any other modeler, and a host of competent builders. Our monthly meets run from March to November and in the winter months we hold indoor meets for members. All club meets include two events and the boys compete for six perpetual trophies. Anyone who wishes to join the Most Active Club East of California (geographic distinction is because of weather only) contact Bill Fletcher at 87-08 Grand Ave., Elmhurst, N. Y."

How about it? Any more contenders for the title, "Most Active Club East of California?" How about the "Most Active Club in California" while we're at it?

More Meets. These are all June 10: Bakersfield, Calif., GMAA record trials (Francis Stewart, 900 21st St.); Cape Girardeau, Mo., Optimist Club and Plymouth Dealers Ill-Mo-Ky meet (E. E. Miner, 541 S. Hanover); West Woodburn, Ore., Starduster's free flight meet (Roy V. Ellison, 5023 N.E. Union, Portland); Defiance, Ohio, Maumee Valley contest sponsored by Exchange Club (A. G. Schilperoot, RFD #1); Schenectady, N. Y., free flight and towline glider club contest by Aeroneers (J. H. Schneider, 355 Mohawk Ave., Scotia); York County, Pa., residents' meet by Hallam Aero Club (John M. Marman, 200 W. Market St.)

June 17 contests: somewhere on Long Island, the L. I. Gas Monkeys' 4th championships (William Altmann, 140-18 169th St., Jamaica 5, N. Y.); McMinnville, Ore., Sky Wolves' free flight contest (James B. Conway, 2014 N. Evans); Record trials by Visalia, Calif., MAA also to be held on July 22, Aug. 19, Sept. 16, Oct. 21, Nov. 18 and Dec. 16 (Emory O. Hull, Jr., Box 284, Ivanhoe, Calif.).

June 24 competitions: Fullerton, Calif., MC stunt meet at Anaheim (Lew Mahieu, 211 Roosevelt Rd., Long Beach). Miami, Fla., Tropic Aeros and Pan American World Airways free flight and PAA-Load meet (William Stoia, 1896 N.W. 36 St.); Wilmington, Dela., Exchange Club meet (W. Lewis Knowles, Jr., 545 Shipley St.).

Contests in July: Connecticut stunt and scale contest for Conn. residents on July 8 at Manchester sponsored by Skyliners (George Fitzgerald, 83½ Charter Oak St.); rubber-powered championship meet of Akron, Ohio, Society of Model Plane Engineers co-sponsored by Akron Women's Chapter, NAA on July 8 (Henry Thomas, 515 Mohawk Ave.); July 20, 21 and 22 at Detroit, Mich., state Plymouth meet restricted to Michiganites sponsored by Plymouth Dealers of Greater Detroit (Merrill C. Hamburg, 467 W. Hancock); Wisconsin state residents' meet at Neenah sponsored by Plymouth dealers and Kiwanis Club (Hugh Ziebell, 630 20th St., Oshkosh).

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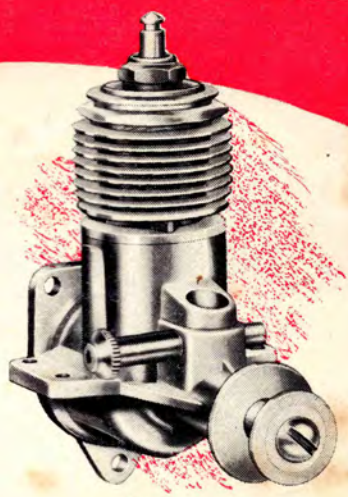

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